Hecla
MONTANA

December 16, 2016

Mr. Herb Rolfes
Hard Rock Mining Bureau
Montana Department of Environmental Quality
PO Box 200901
Helena, Montana 59620-0901

Subject: Application for Minor Amendment of Troy Mine Operating Permit #00093

Dear Mr. Rolfes:

Pursuant to Administrative Rules of Montana (ARM) 17.24.119 (3), Troy Mine, Inc. (TMI) is submitting this application for a minor amendment to Troy Mine Operating Permit #00093. The minor amendment would allow a reduction in reclamation cover soil depth for the Tailings Storage Facility (TSF) from 18-inches to 8-inches.

Background

TMI completed the Troy Mine Revised Reclamation Plan (Reclamation Plan) dated September 2016. The Reclamation Plan describes reclamation elements for final closure of the Troy Mine located near Troy, Montana. The plan was developed using available information and provides a description of elements planned for final reclamation including more definitive reclamation plans for elements identified in the original plan that was submitted to the US Forest Service (USFS) – Kootenai National Forest (KNF) and Montana Department of Environmental Quality (MDEQ) in 2000 in support of Operating Permit #00093. The Revised Reclamation Plan additionally incorporates all modifications resulting from previous reviews and changes required from the 2012 Record of Decision (ROD) and Environmental Impact Statement (EIS).

As the Reclamation Plan was being advanced, TMI determined that active mining would conclude and mine closure activities would be initiated, with an initial focus on preparation for closure of the TSF. Volume estimates included in earlier versions of the Reclamation Plan indicated a topsoil volume in stockpile adequate to provide an 18-inch cover. As part of TSF closure planning, TMI contracted Knight Piesold to confirm the amount of topsoil available from topsoil stockpiles identified for cover of the TSF. The resulting technical memorandum, "Troy Mine TSF Soil Cover - Available Topsoil Volume and Cover Thickness Recommendations", concludes there is approximately 354,000 cubic yards of soil in the stockpiles west of the TSF instead of the 766,000 cubic yards previously reported and evaluated in the 2012 EIS. The volume of topsoil in stockpile equates to a cover soil depth of 8 inches across the TSF. The technical memorandum is included herein as Attachment A.

Understanding that the actual volume in stockpile equates to an 8-inch cover depth, TMI pursued investigation activities to determine whether an 8-inch cover would provide satisfactory re-vegetation. A work plan was developed in consultation with MDEQ and focused on generating a dataset representative of deep (16-18 inches) and shallow (6-8 inches) cover. The objective was to

evaluate whether there was a statistically significant difference in metals uptake in vegetation in areas with shallow (6-8 inches) or deep (16-18 inches) cover soil. The results indicate that with 95% confidence, the mean metals concentrations in vegetation in shallow covers soils are equal to the mean metals concentrations in vegetation in deep cover soils. The low metals levels confirm that metals uptake in vegetation, even 20-30 years after seeding and planting, is not a concern. Additionally, the levels are well below the no observed adverse effect levels published in literature for biological receptors in the area (e.g., meadow vole and deer). The results of this sampling event are described in detail in the Troy Mine TSF Vegetation Sampling Data Summary Report (CDM Smith 2016) included herein as Attachment B.

Based on these findings, TMI requests a minor amendment to Operating Permit #00093 to provide 8-inches of cover soil for the TSF instead of the 18-inches required in the 2012 ROD. The satisfactory reclamation of the TSF embankment, including areas with 8-inches of cover and less, indicates that similar reclamation success can be expected for the top of the TSF with 8-inches of cover.

Minor Amendment Requirements

As described in ARM 17.24.119 (3), an application for minor amendment must:

- contain a summary of proposed changes in sufficient detail for the department to determine whether further environmental analysis under Title 75, chapter 1, MCA, is required;
- contain dated replacement pages and necessary supplemental resource data and plans, and maps in order to identify changes in permit boundaries, total disturbances, and plans;
- contain an updated or comprehensive facilities map;
- contain a statement of the applicant's rationale for asserting nonsignificance pursuant to 82-4-337 (7), MCA;
- identify previous environmental analyses relevant to the amendment; and
- clearly indicate on the facilities map all bonding areas subject to pre-July 1, 1974, bonding levels. No action under this section affects a bond in effect under pre-July 1, 1974, bonding levels.

Each of the required elements to be included in the application for minor amendment are discussed below.

Summary of Proposed Changes

The September 2016 Reclamation Plan describes reclamation elements for final closure of the Troy Mine. The minor amendment would continue to source the total available stockpiled soil from the 44-acre toe pond topsoil piles without change to the stockpile footprint or reclamation practices. The actual 354,000 cubic yards of soil in the stockpiles west of the TSF would be evenly distributed across the TSF as described in the Reclamation Plan, reducing the final soil cover depth from the previously planned 18-inch cover depth to the actual 8-inch cover depth available.

Reclamation Plan Replacement Pages

Enclosed with this letter are replacement pages for the Reclamation Plan as Attachment C. These

pages include discussion of the revised stockpile volume and resultant TSF cover placement depth.

Facilities Map

Updates to the facilities map are not required because the existing mapping is still accurate. The location and footprint of the cover soil source and placement areas have not changed and therefore the facilities map does not require revision.

Statement Asserting Nonsignificance

TMI asserts that the proposed change in cover depth for the TSF from 18-inches to 8-inches does not result in a significant environmental impact that was not previously and substantially evaluated in the 2012 EIS. The 2012 EIS evaluated the impacts associated with sourcing cover soil for the TSF from the soil stockpiles west of the TSF. The 2012 EIS evaluated harvest and placement of 766,000 cubic yards of soil from this location. The known volume existing in these stockpiles has been further assessed and determined to be approximately 354,000 cubic yards. The proposed change only affects the volume and depth of soil placed. It does not change the outcome of the evaluation performed in the 2012 EIS.

The soil will still be lacustrine and volcanic ash-derived soil sourced from the stockpiles west of the TSF with berms on either side to protect the toe ponds and Lake Creek from runoff during construction and reclamation of the stockpile area. The soil will be ripped, amended and mulched as needed to prevent soil crusting and provide for long-term nitrogen needs. The proposed amendment maintains the same soil source and placement as evaluated in the 2012 EIS; therefore, TMI believes that the 2012 EIS adequately evaluated impacts associated with the proposed amendment as the only change is in the depth and volume of cover soil placed.

Previous Environmental Analyses

The following presents the results of the environmental analyses performed in the 2012 EIS for the portions of the Agency-Mitigated Alternative (Selected Alternative in the 2012 ROD) related to the TSF reclamation. A statement regarding how the proposed change might affect the outcome of the previously completed analyses is also included.

- ***Air Quality*** – The 2012 EIS determined that minor negative air quality impacts are anticipated during reclamation activities, but are not expected to be greater in duration, frequency, or intensity than historical levels during mining activities. The reduction in cover soil volume placement would lead to a reduction in the duration of reclamation activities. This is likely to lessen the impact to short-term air quality while achieving the same long-term result of a generally neutral air quality impact.

- ***American Indian Consultation*** – The 2012 EIS determined that reclamation and closure activities would primarily occur on or within areas that were previously disturbed during mining activities and as such would have minimal and indirect effects on cultural resources affiliated with tribal groups or traditional cultural properties. The proposed change in cover depth will not affect the outcome of this assessment because the soil will be sourced from the same previously disturbed location included in the 2012 EIS.

- ***Cultural Resources*** – The 2012 EIS determined that there are no known environmental direct, indirect or cumulative effects related to cultural resources. No historic properties were identified prior to mine development and no historic or archeological resources have been identified during mine operation. The proposed change will not affect the outcome of this

assessment because the soil will be sourced from the same previously disturbed location included in the 2012 EIS.

- ***Fish Habitat*** – The 2012 EIS determined that potential short-term water quality impacts to fisheries and/or aquatic habitat would be minimized by implementing BMPs, revegetating, and managing water to control erosion both during and after reclamation. Sediment levels in Stanley and Lake creeks would be expected to decline over time. Measurable effects to occupied bull trout and westslope cutthroat trout habitat is not anticipated. The reduction in cover soil volume placement would lead to a reduction in the duration of reclamation activities. This would shorten the duration of potential short-term impacts and would lead to the same expected long term reduction in sediment levels more quickly.

- ***Geology*** – The 2012 EIS determined that the use of rocky glacial and lacustrine and volcanic ash derived soils as growth media would minimize root contact with mine materials, which would effectively minimize the potential effects of plant uptake of metals from the tailings. The proposed change does not affect the outcome of this evaluation given the data collected from the TSF embankment showing no difference in the mean metals concentration in grass and pine needles for locations with shallow (6-8 inches) and deep (16-18 inches) cover soil.

- ***Hydrology*** – The 2012 EIS determined that there would be slight increases in the short-term risk of sediment delivery to Lake Creek during reclamation because the soil stockpiles located near Lake Creek and the toe ponds were selected as the cover soil source. The vegetated lower portion of the stockpiles would be retained to filter sediment, and the disturbed area would be revegetated, thus minimizing long-term risk to surface water. There are no anticipated impacts to groundwater associated with the TSF cover. The proposed change does not affect the outcome of this evaluation because the same soil source will be used and revegetation along with BMPs are planned to minimize the risk of short-term surface water impacts.

- ***Land Use*** – The 2012 EIS determined that reclamation would return private and patented lands, including the TSF, to post-mine land uses of timber production, wildlife habitat and recreation. The most likely of these uses for the TSF is wildlife habitat. There are no mitigation measures identified regarding limits to be imposed on the return of pre-operational levels of access, recreation, and big game use. The proposed change does not affect the outcome of this evaluation because the data collected from the TSF embankment shows that there is no difference in the mean metals concentration (and thus metals uptake) between vegetation in shallow (6-8 inches) and deep (16-18 inches) cover. The metals concentrations for both categories are significantly lower than levels of concern for biological receptors in the area including the meadow vole and deer.

- ***Recreation*** – The 2012 EIS determined that by closing the mine and reclaiming the land, a large local disturbance would be removed, the land would be revegetated, thereby increasing potential for big game hunting and recreational use of public lands. While the TSF is on private land, the reclamation of this portion of the mine will provide big game habitat that will benefit the adjacent public lands. The proposed change does not affect the outcome of this evaluation because the data collected from the TSF embankment shows that there is no difference in the mean metals concentration (and thus metals uptake) between vegetation in shallow (6-8 inches) and deep (16-18 inches) cover. The metals concentrations for both categories are significantly lower than levels of concern for biological receptors in the area including the meadow vole and deer.

- ***Socioeconomics*** – The 2012 EIS determined that reclamation would provide a small net positive effect over the short-term to local and regional socioeconomic resources in the form of economic gains related to reclamation activities. The proposed change would require salvage and placement of a lesser volume of soil; however, economic impact is considered minimal when compared to the boost provided by the remaining reclamation activities.

- ***Reclamation Materials*** – The 2012 EIS determined that use of the lacustrine and volcanic ash derived soil combined with ripping of the existing ground surface prior to cover placement, incorporation of an organic amendment, mulching, fertilizer to provide sufficient nitrogen, inoculation with mycorrhizal fungi and performance standards for cover survival would provide the most favorable soil quality and long-term potential productivity. The proposed change is not anticipated to affect the outcome of this evaluation. The risk of phytotoxicity is considered low because of the robust, healthy vegetation established for 20-30 years on the TSF embankment, which has variable cover depth including locations less than 8-inches. The data collected from the TSF embankment shows no difference in the metals uptake between shallow and deep cover soils. The proposed change incorporates the other elements of the selected alternative in the ROD with the only change being the depth of cover soil.

- ***Sound*** – The 2012 EIS determined that there would be short-term minor negative impact related to sound during reclamation activities due to the use of heavy equipment. It would also result in a long-term minor positive impact related to sound after reclamation due to reduced motorized equipment use and human related activities. The proposed change would reduce the duration of short-term minor negative impacts due to the reduction in soil volume being placed.

- ***Transportation*** – The 2012 EIS determined that there would be a substantial reduction in traffic after reclamation activities are completed. The analysis focused primarily on roads on public lands. The private roads used to access the TSF would be field reviewed by the Agencies to decide if they are needed for post-mine land uses. The proposed change has the potential to reduce short-term road maintenance costs due to the reduction in volume of soil to be hauled on the TSF access roads.

- ***Vegetation*** – The 2012 EIS determined that the use of lacustrine and volcanic ash-derived soil and addition of long term organic nutrients would encourage greater cover of native plants. Proposed, threatened, endangered, and sensitive plant species have not been identified within the Troy Mine Permit Area. Reclamation activities are not expected to occur in, or impact, areas of old growth forest. The proposed change reduces the depth of soil placed, but still provides adequate growth medium as evidenced by the successful revegetation of the TSF embankment. While the water holding capacity of the cover soil is greater than that of the glacial outwash borrow material or the tailings, it supports healthy vegetation growth on the TSF embankment at variable depths, including those less than 8-inches.

- ***Visual/Scenery*** – The 2012 EIS determined that reclamation of the TSF would result in a forested landscape that would eventually return the heavily altered visual condition to a slightly to moderately altered visual class after several decades. No new disturbed areas would be needed to obtain growth medium. The proposed change is not anticipated to affect the outcome of this evaluation as comparable revegetation is expected.

- ***Wildlife*** – The 2012 EIS determined that reclamation in the TSF area would be located

within the Troy Polygon where no reoccurring grizzly bear use has been documented. Because these areas have been used historically and would be used in the future, no new impacts to grizzly bears would result. Reclamation activities in the TSF area are not located within the Ross Lynx Analysis Unit and therefore, there would be no direct effects on Canada lynx. The western toad is known to occupy the toe ponds, which will be retained. BMPs will be installed to protect water quality in the toe ponds and to help keep western toads in the ponds and away from active construction areas. There are no long-term negative impacts to other sensitive species associated with the TSF reclamation. The proposed change is not anticipated to affect the outcome of these analyses as the disturbance activities are performed in the same footprint (i.e., the soil stockpiled west of the TSF and the surface of the TSF) as evaluated in the 2012 EIS.

Pre-July 1, 1974 Bonding

A facilities map showing all bonding areas subject to pre-July 1, 1974 bonding levels is not required as no such bonding areas are present at the Troy Mine.

Summary

In closing, TMI is committed to responsibly and expeditiously achieve closure for the Troy Mine. Among the first priorities is the reclamation of the TSF. TMI has undertaken several investigation and planning activities in 2015 and 2016 in preparation for the installation of soil cover and re-vegetation of the TSF.

Plans are in place to begin construction on the TSF as soon as weather permits in 2017. TMI requests the assistance of MDEQ with processing the environmental review of this permit amendment by the end of March 2017 to allow mine closure reclamation to commence as soon as practicable.

TMI looks forward to working with MDEQ through this environmental review process.

Respectfully submitted,

Wesley Sturdy For

Doug Stiles, PE
General Manager

cc: Bobbie Lacklen – Minerals and Geology Program Manager, Kootenai National Forest

Enclosures:
Attachment A: Troy Mine TSF Soil Cover - Available Topsoil Volume and Cover Thickness Recommendations, Knight Piesold, 2016
Attachment B: Vegetation Sampling Data Summary Report, CDM Smith 2016
Attachment C: Replacement Reclamation Plan pages per ARM 17.24.119 (3)(b)

Attachment A – Troy Mine TSF Soil Cover - Available Topsoil Volume and Cover Thickness Recommendations, Knight Piesold, 2016

TECHNICAL MEMORANDUM

Date: August 8, 2016 File No.: VA101-00280/12-A.01

Cont. No.: NB16-00437

Re: Troy Mine TSF Soil Cover - Available Topsoil Volume and Cover Thickness Recommendations

1 – INTRODUCTION

1.1 GENERAL

Revett Silver Company (Revett) engaged Knight Piésold Ltd. (KP) to provide engineering services for closure and reclamation of the Troy Mine. The Troy Mine is an underground copper and silver mine located south of the town of Troy in Lincoln County, Montana. The mine facilities consist of the underground mine, the mill, the office facilities, the tailings and reclaim water pipelines, a power line, a Tailings Storage Facility (TSF), and a number of associated facilities.

The Record of Decision (ROD) and Final Environmental Impact Statement (FEIS) for the Troy Mine indicate that the revegetation of the TSF and embankments will include an 18-inch thick layer of soil sourced from the topsoil stockpiles (KNF and MT DEQ, 2012a; KNF and MT DEQ, 2012b).

This memo provides a summary of the recommended thickness of the soil cover for revegetation of the TSF. These recommendations are based on site information, a review of various closure plans, and the reclamation efforts at mine sites in Canada and the northwestern United States.

1.2 AVAILABLE TOPSOIL VOLUME

A recent site investigation program was completed to assess the amount of topsoil availability from the existing stockpiles (KP, 2016). Figure 1 shows the locations of these stockpiles. Results from the investigation indicate that the volume of stockpiled soil will only be sufficient for approximately eight to ten inches of cover over the TSF. Figure 2 shows two potential excavation options for collection of the stockpiled cover material. Option 1 maintains the toe ponds and provides approximately eight inches of cover material. Option 2 removes the toe ponds, which would maximize the amount of cover material available for revegetation of the TSF and increase the cover thickness to nearly ten inches. Removing the toe ponds is preferred to reduce the possible issues with regard to long term pond stability. Stockpiled soil depth data from historic and new test pits as well as drillholes were used to calculate soil availability with the help of AutoCAD 3D (Figures 1 and 2). The maximum allowable excavation depth of the soil was limited to the foundation elevation of the TSF embankment. AutoCAD volume calculations determined the following:

1. Option 1 would yield an estimated topsoil volume of 88,500 Cu. Yd. and 265,500 Cu. Yd. of lacustrine material, totalling approximately 354,000 Cu. Yd.
2. Option 2 would yield an estimated topsoil volume of 110,000 Cu. Yd. and 330,000 Cu. Yd. of lacustrine material, totalling approximate of 440,000 Cu. Yd.

Given the above information, KP has evaluated the suitability of using an eight to ten inch soil cover for revegetation of the TSF.

2 – REVIEW SUMMARY

A review of the available site information was completed to determine cover thicknesses and information from additional mines and projects. The information reviewed, included:

- ROD/FEIS reports from projects in the state of Montana
- Closure and Reclamation plans in Canada

- Experience of KP Senior Engineers and Scientists and Scientists from Herrera Environmental Consultants Inc. (Herrera)

It should be noted that the majority of available literature focusses on the reclamation of acid-generating tailings and very little information exists for soil covers on potentially non-acid generating tailings. As such, review efforts focused on soil covers for potentially non-acid generating tailings. The following is a summary of relevant findings:

- The native topsoil observed at the mine site averages less than six inches and supports successful vegetation growth. Photographs showing the topsoil thickness exposed by an overturned tree in the area of the TSF are provided in Appendix A (Photo Nos. 1 and 2).
- Laboratory results from testing of the near surface tailings material (KP, 2016) indicates that there is minimal variability in the moisture retention capacity between the coarser tailings near the discharge points at the embankments and the finer tailings near the lower elevations of the TSF. The moisture retention capacity is also relatively consistent between the four cells of the TSF. The moisture retention capacity is higher in the topsoil than in the tailings, which suggests that the soil cover will have more of an influence on moisture content in the final cover system. The soil moisture retention results are provided in Appendix B.
- Inductively Coupled Plasma (ICP) Mass Spectrometry completed on the near surface tailings material indicated that copper (Cu) concentrations are only slightly elevated (KP, 2016). The DTPA-Extractable Metals testing showed that on average only nine percent of the total copper is bioavailable to plants (KP, 2016). This is a relatively low concentration of Cu available to plants and is also considered to be not significant with respect to impacting plant growth. The test results for the tailings samples are provided in Appendix B.
- The embankments surrounding the TSF were revegetated in the late 1990's using a thin layer of soil (estimated to be less than eight inches) on top of the tailings. In 2015, KC Harvey Environmental, LLC (KC Harvey) and the Department of Environmental Quality (DEQ) conducted a visual inspection of the embankments to assess the vegetation, cover and stability. It was reported that there was good establishment of ground cover and overstory, and that no significant bare ground was noted (KC Harvey, 2016). A recent photograph of the revegetated TSF embankment showing the vegetation is provided in Appendix A (Photo No. 3). Leonard Ballek, Scientist for Herrera Environmental Consulting Inc. (Herrera) also indicated in an email that the vegetation on the TSF embankments was also performing well based on his observations in early 2016 (personal communication, July, 2016).
- The Hard Fescue planted directly on the nutrient poor tailings is growing without the addition of amendments or fertilizer; however, it is not thriving under the current conditions. Root development of the Hard Fescue is also well established. Photographs of the vegetation and the roots of the vegetation growing on the TSF are included in Appendix A (Photos Nos. 4, 5 and 6).
- Stillwater Mining Company's (SMC), Stillwater Mine Impoundment included two alternatives for tailings cover in their ROD, both of which included eight inches of topsoil on top of waste or borrow material (USDA and MT DEQ, 2012). The waste or borrow materials were non-acid generating.
- A review of 16 accepted Mine Closure Plans in Ontario, Canada was completed previously by KP in 2010. These Closure Plans included a growth medium of soil, peat or bio-solids to cover waste rock piles, tailings, and broken concrete foundation areas. The thickness of the soil covers varied from 6 to 12 in (KP, 2010).
- The Bissett Creek Project, in Ontario, submitted a Closure Plan, which included a cover of eight inches of topsoil directly on top of potentially non-acid generating tailings. This Closure Plan was accepted by the Ministry of Northern Development and Mines (MNDM) in 2013 (KP, 2013).

- Personal communications with Mr. Kevan Cowcill, a Senior Biologist/Ecologist with KP, and Leonard Ballek, Scientist for Herrera have indicated that eight to ten inches of topsoil is generally sufficient for revegetation for a variety of applications. Often grasses only require three to six inches of topsoil to be successful (personal communication, July, 2016).

3 – CONCLUSIONS AND RECOMMENDATIONS

It is expected that an eight to ten inch soil cover will be sufficient for successful revegetation on the potentially non-acid generating tailings at the Troy Mine. This conclusion is based on the information reviewed and site observations. Evidence from native vegetation species growing at the site and successful historical embankment revegetation on a thin topsoil layer placed over tailings, indicates that topsoil depth does not completely control the success of the vegetation. Ultimate success of the revegetation will depend on the species of vegetation planted, sufficient topsoil nutrients, and diligent monitoring and maintenance of the revegetated area.

The following will be carried out to assist with the overall success of the revegetation efforts:

- The compacted tailings surface will be ripped before soil cover placement
- Following placement of the soil cover, the soil will then also be ripped before seeding/planting
- The soil will be amended with a slow-release organic fertilizer applied during seeding of the cover

4 – REFERENCES

Ballek, L. (Herrera), personal communication, July, 2016.

Cowcill, K. (KP), personal communication, July,

KC Harvey Environmental, LLC. (KC Harvey), 2016. *Characterization of Vegetation and Soil Properties at the Troy Mine, Lincoln County, Montana*. January. Bozeman, Montana.

Knight Piésold Ltd. (KP), 2010. Letter to: Stephanie Thibeault, Xstrata Copper Canada - Kidd Mine Site. Re: *Closure Revegetation Benchmark Study*. August 31. North Bay, Ontario. Ref. No. NB10-00340.

Knight Piésold Ltd. (KP), 2013. *Closure Plan Amendment*. June 5. North Bay, Ontario. Ref. No. NB102-102/9-7, Rev 1.

Knight Piésold Ltd. (KP), 2016. *Reclamation and Closure Design - Site Investigation Report*. July 15. North Bay, Ontario. Ref. No. VA101-280/12-4, Rev 0.

Troy Mine Inc., 2016. *Revett Mining - Troy Mine - Revised Reclamation Plan*. March 14. Troy, Montana. (Appendix F).

United States Department of Agriculture and the Montana Department of Environmental Quality (USDA and MT DEQ), 2012. *Record of Decision for Stillwater Mining Company's Revised Water Management Plans and Boe Ranch LAD*. Stillwater and Sweet Grass Counties, Montana.

USDA Forest Service, Kootenai National Forest (KNF) and Montana Department of Environmental Quality (MT DEQ). 2012a. *Final Environmental Impact Statement - Troy Mine Revised Reclamation Plan*. June 2012. 1731 pp.

USDA Forest Service, Kootenai National Forest (KNF) and Montana Department of Environmental Quality (MT DEQ). 2012b. *Record of Decision for Troy Mine Revised Reclamation Plan*. September 2012. 42 pp.

5 – CLOSURE

Should you have any comments or questions please do not hesitate to contact the undersigned.

Prepared:

Ryan Weir, P.Eng. - Project Engineer

Reviewed:

Steven R. Aiken, P.Eng. - Manager, Environmental Services

Approval that this document adheres to Knight Piésold Quality Systems:

Attachments:

Figure 1 Rev 0	Topsoil Stockpile Areas - Plan
Figure 2 Rev 0	Topsoil Stockpile Areas - Options A and B - Sections
Appendix A	Select Photographs
Appendix B	Laboratory Results

/rdw

17 557 000 N
17 558 250 N
17 559 500 N
17 560 750 N
17 562 000 N
17 563 250 N
1 916 250 E
1 917 500 E
1 918 750 E
1 920 000 E

TOPSOIL STOCKPILE AREA (TOPSOIL REMOVED)
TOPSOIL STOCKPILE AREA (TOPSOIL REMOVED)
LAKE CREEK
DH16-01
DH16-02
DH16-03
DH16-04
DH16-05
DH16-06
DH16-07
DH16-08
DH16-09
DH16-10
DH16-11
DH16-12
DH16-13
DH16-14
DH16-15
SP-1
SP-2
SP-3
SP-4
SP-5
SP-6
4+50
4+00
3+00
2+00
1+00
0+00
1
2
FIG
TSF CELL 1
TSF CELL 2
TSF CELL 3
TSF CELL 4
TAILINGS STORAGE FACILITY
DECANT POND
LIMITS OF UPDATED TOPOGRAPHIC SURVEY
2220
2240
2260
2280
2300
2320
2340
2360
2380
2400
2420
2440
2460

LEGEND:

- KCH TEST PIT (2015)
- DRILLHOLE
- TOPSOIL STOCKPILE LIMITS

NOTES:

1. COORDINATE GRID IS NAD83 (2011) DATUM AND ELEVATIONS ARE IN MSL, (GEOD12B). UNITS ARE US SURVEY FEET.
2. PLAN BASED ON INFORMATION PROVIDED BY ELECDATA DATED JUNE 8, 2016.
3. CONTOUR INTERVAL IS 5 FEET.
4. KC HARVEY TEST PIT LOCATIONS ARE APPROXIMATE ONLY. TOPSOIL THICKNESS OBTAINED FROM KC HARVEY, (KCH, 2016).
5. ONLY OPTION B SHOWN.

250 0 250 500 750 1000 1250 ft
SCALE A

PLAN
SCALE A

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	10AUG'16	ISSUED WITH MEMO	CAP	MMD	SRA

REVETT SILVER COMPANY

TROY MINE

TOPSOIL STOCKPILE AREAS PLAN

Knight Piésold CONSULTING

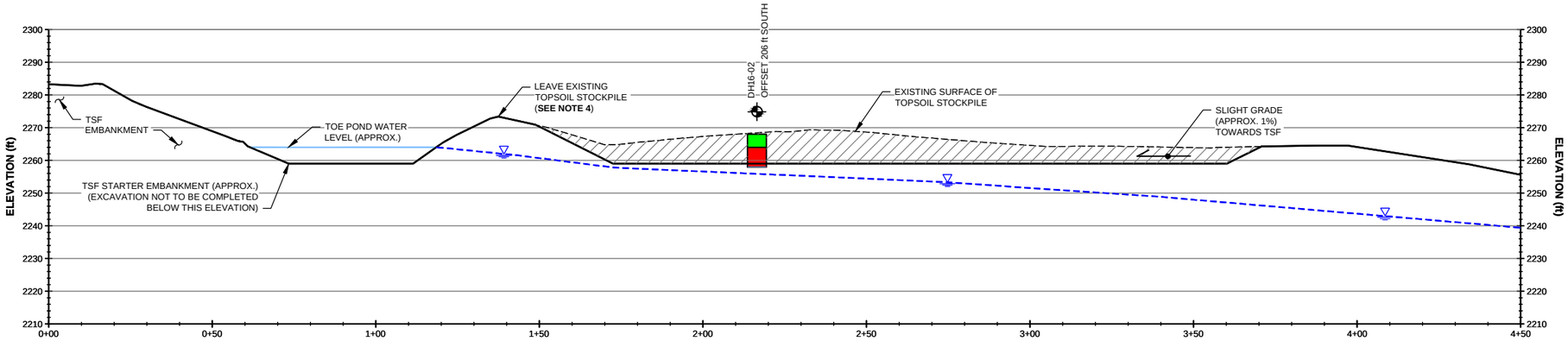
P/A NO. VA101-280/12

REF NO. NB16-00437

FIGURE 1

REV 0

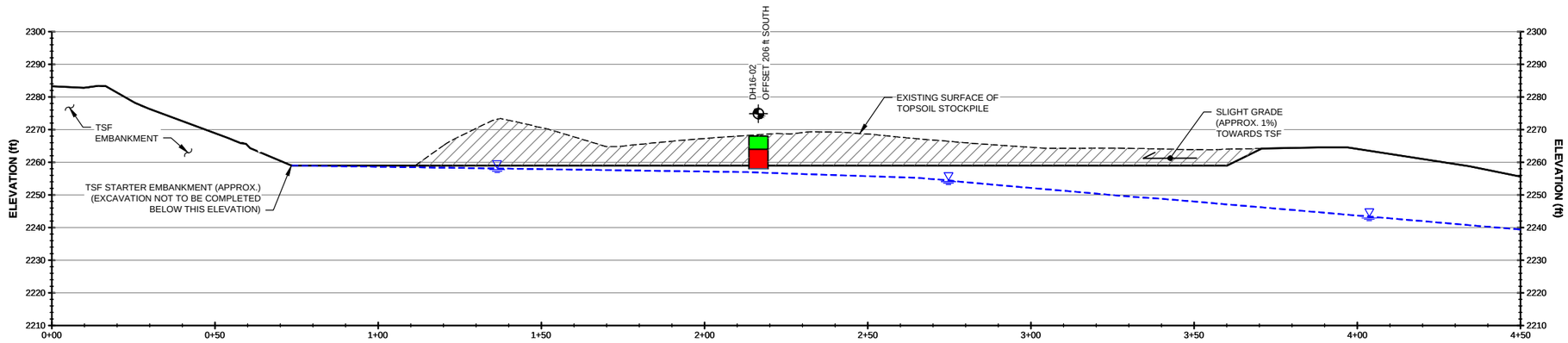
SAVED: I:\101\00280\12\A\Acad\FIGS\B05_r0, 8/10/2016 10:58:15 AM, MDEMERS, PRINTED: 8/10/2016 10:59:11 AM, PLAN, MDEMERS
XREF FILE(S): IMAGE FILE(S): TroyMine_Ortho_25cm_NAD83ftUM1.tif



1 1 FIG **SECTION**

OPTION A - TOE POND RETAINED

SCALE A



2 1 FIG **SECTION**

OPTION B - TOE POND REMOVED

SCALE A

	APPROXIMATE VOLUME OF AVAILABLE TOPSOIL AND LACUSTRINE MATERIAL (SEE NOTE 5)	ESTIMATED TOPSOIL VOLUME	ESTIMATED LACUSTRINE VOLUME
OPTION A (TOE POND RETAINED)	354,000 Cu. Yd.	88,500 Cu. Yd.	265,500 Cu. Yd.
OPTION B (TOE POND REMOVED)	440,000 Cu. Yd.	110,000 Cu. Yd.	330,000 Cu. Yd.

LEGEND:

- TOPSOIL
- LACUSTRINE
- TOPSOIL AND LACUSTRINE MATERIAL TO BE EXCAVATED
- DRILLHOLE
- EXISTING GROUND SURFACE
- ESTIMATED GROUNDWATER ELEVATION

NOTES:

1. SECTIONS BASED ON INFORMATION PROVIDED BY ELECDATA DATED JUNE 8, 2016.
2. DIMENSIONS ARE IN FEET, UNLESS NOTED OTHERWISE.
3. KC HARVEY TEST PIT LOCATIONS ARE APPROXIMATE ONLY. TOPSOIL THICKNESS OBTAINED FROM KC HARVEY, (KCH, 2016).
4. STABILITY OF BERM WILL NEED TO BE REVIEWED PRIOR TO TOPSOIL EXCAVATION.
5. NO SWELL OR COMPACTION FACTORS HAVE BEEN CONSIDERED FOR THE VOLUMES PRESENTED.

SCALE A 20 0 20 40 60 80 100 ft

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	10AUG'16	ISSUED WITH MEMO	CAP	MMD	SRA

REVETT SILVER COMPANY

TROY MINE

TOPSOIL STOCKPILE AREAS
OPTIONS A AND B
SECTIONS

Knight Piésold CONSULTING

P/A NO. VA101-280/12

REF NO. NB16-00437

FIGURE 2

REV 0

Knight Piésold
CONSULTING

APPENDIX A

SELECT PHOTOGRAPHS

(Pages A-1 to A-2)

Photo 1 - Overturned Tree

Photo 2 - Overturned Tree Topsoil Thickness

Photo 3 - Revegetated West TSF Embankment (taken March 2016)

Photo 4 - Fescue Planted Directly on Cell 2 Tailings

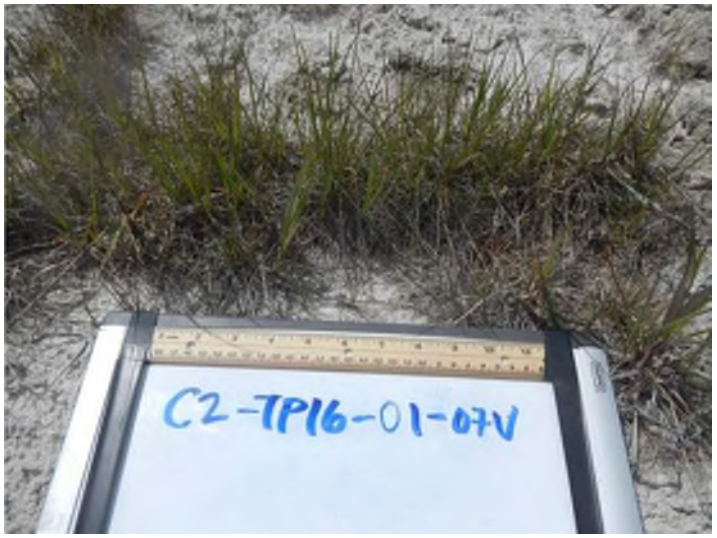


Photo 5 - Close-up of Cell 2 Fescue

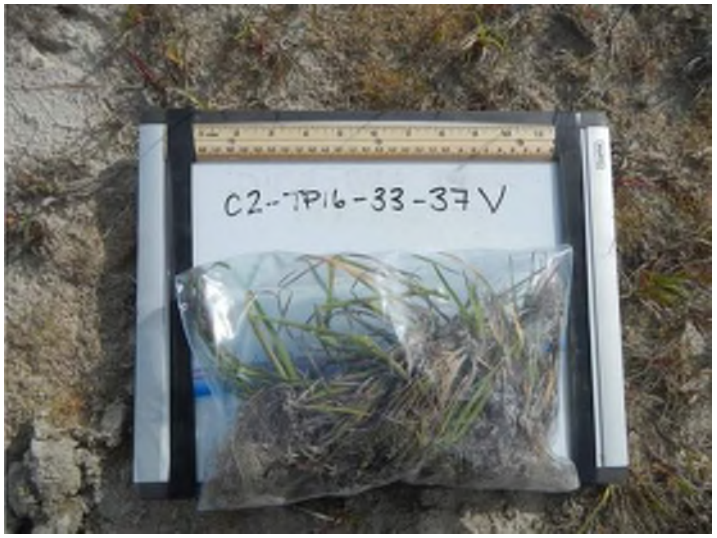


Photo 6 - Sampled Fescue Showing Root System

Knight Piésold
CONSULTING

APPENDIX B

LABORATORY RESULTS

(Pages B-1 to B-4)

Knight Piésold CONSULTING

TABLE B.1

REVETT SILVER COMPANY
TROY MINE

TROY MINE TSF SOIL COVER - AVAILABLE TOPSOIL VOLUME AND COVER THICKNESS RECOMMENDATIONS
LABORATORY RESULTS - TOPSOIL STOCKPILES

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Laboratory Sample ID Knight Piésold Sample ID Matrix Type Sample Collection Date	H16050512-001 DH16-01-01-0-1.5 ftC Soil 5/17/2016	H16050512-003 DH16-01-03-4-8.5 ftC Soil 5/17/2016	H16050512-005 DH16-02-02-1.5-4 ftC Soil 5/17/2016	H16050425-005 DH16-03-01-0-1.5 ft Soil 5/16/2016	H16050425-007 DH16-03-03-4-9.5 ft Soil 5/16/2016	H16050512-008 DH16-04-02-1.5-4 ftC Soil 5/17/2016	H16050512-009 DH16-04-03-4-14 ftC Soil 5/17/2016	H16050425-002 DH16-05-02-1.5-4 ft Soil 5/16/2016	H16050425-003 DH16-05-03-4-11 ft Soil 5/16/2016
Sample Collection Date	25	34	<2	<2	<2	31	33	24	<2
Carbon Nitrogen Ratio	7.3	11.5	17.1	14.1	3.3	18.0	16.2	6.4	8.8
Moisture, wt %	8.1	9.5	19.8	-	-	8.5	28.3	-	-
Sand, %	52	53	28	24	44	32	56	60	27
Silt, %	36	37	58	60	47	53	32	36	60
Clay, %	12	10	14	16	9	15	12	4	13
Texture	L	SL	SiL	SiL	L	SiL	SL	SL	SiL
pH 1:5, s_u				-	-			-	-
pH-SatPst, s_u_	6.2	6.3	6.2	5.8	6.3	6.3	5.6	6.2	6.2
COND-SatPst, mmhos/cm	0.2	0.3	0.2	<0.1	<0.1	0.2	0.5	0.2	0.1
Ca-SatPst-Sat Paste, meq/L	1.13	1.18	0.71	0.43	0.2	0.41	1.24	0.76	0.59
Mg-SatPst-Sat Paste, meq/L	0.57	0.54	0.39	0.3	0.19	0.21	0.64	0.53	0.46
Na-SatPst-Sat Paste, meq/L	0.30	0.28	0.26	0.15	0.17	0.30	0.63	0.7	0.31
SAR, unitless	0.3	0.3	0.4	0.2	0.4	0.5	0.6	0.9	0.4
K-NH4OAC, mg/kg	67	115	201	138	41	187	123	82	111
OM-LOI, %	1.0	2.2	2.2	2.1	<0.2	3.3	2.7	0.2	1.3
0_5 in _ Rtnd, wt%-dry	3.0	23.8	< 0.1	< 0.1	< 0.1	11.7	5.0	4.3	< 0.1
No 4 Rtnd, wt%-dry	12.8	5.2	< 0.1	< 0.1	< 0.1	12.0	15.1	19.7	1.8
No 10 Rtnd, wt%-dry	9.3	4.8	1.6	< 0.1	3.2	7.6	12.9	12.1	3.9
No 20 Rtnd, wt%-dry	11.1	6.1	6.2	9.6	5.6	7.9	14.3	14.4	9.4
No 40 Rtnd, wt%-dry	9.7	7.4	10.2	13.4	5.1	7.3	10.0	9.7	10.5
No 60 Rtnd, wt%-dry	8.9	9.1	10.7	7.1	8.6	6.4	8.4	8.7	7.9
No 100 Rtnd, wt%-dry	10.0	12.1	11.2	8.5	28.2	7.6	8.7	6.6	9.6
No 200 Rtnd, wt%-dry	11.1	11.6	13.9	11.4	32.5	8.5	7.7	7.5	17.4
Pan, wt%-dry	24.3	19.9	46.3	50	16.9	31.1	18.0	17	39.4
Carbon, Total, %	0.5	0.8	1.3	1.4	0.1	1.9	1.0	0.4	0.9
P, Olsen-Olsen, mg/kg	8	12	52	35	3	21	17	14	18
Ammonia as N, KCL Extract, mg/kg	24	45	70	4	<0.5	78	57	1.7	4.6
NO3, mg/kg Dry	1.2	<1	1.7	1.1	<1	<1	<1	<1	<1
TKN, mg/kg	655	714	784	992	392	1030	629	581	1000
N-Total, mg/kg	660	710	790	990	390	1000	630	580	1000
B-CACL2, mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1
Se-CACL2, mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ag-DTPA, mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1
Al-DTPA, mg/kg	47	29	34	90	6	18	92	22	23
Cu-DTPA, mg/kg	5	6	4	7	3	7	6	10	6
Fe-DTPA, mg/kg	66	156	210	134	49	194	166	60	187
Mn-DTPA, mg/kg	7	100	75	5	<1	143	102	8	90
Sb-DTPA, mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1
Zn-DTPA, mg/kg	1	1	<1	2	<1	1	1	2	1
Ag, mg/kg-dry	-	-	-	-	-	-	-	-	-
Al, mg/kg-dry	-	-	-	-	-	-	-	-	-
B, mg/kg-dry	-	-	-	-	-	-	-	-	-
Ba, mg/kg-dry	-	-	-	-	-	-	-	-	-
Be, mg/kg-dry	-	-	-	-	-	-	-	-	-
Ca, mg/kg-dry	-	-	-	-	-	-	-	-	-
Cd, mg/kg-dry	-	-	-	-	-	-	-	-	-
Co, mg/kg-dry	-	-	-	-	-	-	-	-	-
Cr, mg/kg-dry	-	-	-	-	-	-	-	-	-
Cu, mg/kg-dry	-	-	-	-	-	-	-	-	-
Fe, mg/kg-dry	-	-	-	-	-	-	-	-	-
K, mg/kg-dry	-	-	-	-	-	-	-	-	-
Mg, mg/kg-dry	-	-	-	-	-	-	-	-	-
Mn, mg/kg-dry	-	-	-	-	-	-	-	-	-
Mo, mg/kg-dry	-	-	-	-	-	-	-	-	-
Na, mg/kg-dry	-	-	-	-	-	-	-	-	-
Ni, mg/kg-dry	-	-	-	-	-	-	-	-	-
P, mg/kg-dry	-	-	-	-	-	-	-	-	-
Pb, mg/kg-dry	-	-	-	-	-	-	-	-	-
Se, mg/kg-dry	-	-	-	-	-	-	-	-	-
Si, mg/kg-dry	-	-	-	-	-	-	-	-	-
Ti, mg/kg-dry	-	-	-	-	-	-	-	-	-
Tl, mg/kg-dry	-	-	-	-	-	-	-	-	-
V, mg/kg-dry	-	-	-	-	-	-	-	-	-
Zn, mg/kg-dry	-	-	-	-	-	-	-	-	-
Density, g/cc	1.4	1.6	1.2	1	1.8	1.3	1.4	1.6	1.6
1/3 Bar Moisture, wt%	19	19	35	-	-	40	-	-	-
15 Bar-DRY, wt%	4.0	4.4	7.3	-	-	8.7	-	-	-

Knight Piésold CONSULTING

TABLE B.1

REVETT SILVER COMPANY
TROY MINE

TROY MINE TSF SOIL COVER - AVAILABLE TOPSOIL VOLUME AND COVER THICKNESS RECOMMENDATIONS
LABORATORY RESULTS - TOPSOIL STOCKPILES

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Laboratory Sample ID Knight Piésold Sample ID Matrix Type Sample Collection Date	H16050510-006 DH16-06-02-1.5-4 ft Soil 5/17/2016	H16050424-001 DH16-07-01-0-1.5 ft Soil 5/16/2016	H16050424-003 DH16-07-03-4-9 ft Soil 5/16/2016	H16050424-005 DH16-08-02-1.5-4 ft Soil 5/16/2016	H16050508-001 DH16-09-01-0-1.5 ft Soil 5/18/2016	H16050508-003 DH16-09-03-4-10 ft Soil 5/18/2016	H16050508-006 DH16-10-02-1.5-4 ft Soil 5/18/2016	H16050508-008 DH16-10-04-10-18 ft Soil 5/18/2016	H16050529-001 DH16-11-01-0-1.5 ft Soil 5/19/2016
Coarse Fragments, %	<2	-	-	-	<2	<2	<2	<2	<2
Carbon Nitrogen Ratio	6.4	-	-	-	12.3	3.0	15.7	3.1	9.3
Moisture, wt %	18.0	-	-	-	18.4	21.4	28.2	22.5	14.8
Sand, %	12	44	54	62	56	14	6	4	54
Silt, %	79	56	36	30	32	78	78	84	43
Clay, %	9	<1	10	8	12	8	16	12	3
Texture	S	SiL	SL	SL	SL	SiL	SiL	SiL	SL
pH 1:5, s_u	-	-	-	-	6.2	5.5	6.1	5.5	-
pH-SatPst, s_u_	6.3	5.8	6.2	6.7	0.2	<0.1	<0.1	<0.1	6.0
COND-SatPst, mmhos/cm	0.2	0.1	<0.1	<0.1	0.70	0.10	0.35	0.19	0.4
Ca-SatPst-Sat Paste, meq/L	0.99	0.46	0.30	0.20	0.35	0.12	0.22	0.17	0.78
Mg-SatPst-Sat Paste, meq/L	0.49	0.29	0.21	0.20	0.57	0.18	0.20	0.26	0.48
Na-SatPst-Sat Paste, meq/L	0.20	0.16	0.14	0.22	0.8	0.5	0.4	0.6	0.27
SAR, unitless	0.2				158	50	116	58	0.3
K-NH4OAC, mg/kg	40	122	92	36	3.5	0.3	3.0	0.5	90
OM-LOI, %	<0.2	2.5	<0.2	<0.2	< 0.1	< 0.1	< 0.1	< 0.1	1.4
0_5 in _ Rtnd, wt%-dry	< 0.1	-	-	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
No 4 Rtnd, wt%-dry	< 0.1	-	-	-	< 0.1	< 0.1	< 0.1	1.1	0.2
No 10 Rtnd, wt%-dry	1.3	-	-	-	9.5	5.9	6.5	8.8	0.2
No 20 Rtnd, wt%-dry	7.5	-	-	-	9.5	6.7	10.5	9.3	0.7
No 40 Rtnd, wt%-dry	6.3	-	-	-	10.2	4.5	8.2	6.7	2.7
No 60 Rtnd, wt%-dry	5.2	-	-	-	8.5	4.1	7.5	6.4	23.6
No 100 Rtnd, wt%-dry	7.1	-	-	-	11.1	6.3	8.0	5.9	14.4
No 200 Rtnd, wt%-dry	8.3	-	-	-	51.4	72.6	59.3	61.8	13.9
Pan, wt%-dry	64.2	-	-	-	1.8	0.1	1.7	0.2	44.3
Carbon, Total, %	0.3	1.4	0.1	0.1	10	5	26	8	0.7
P, Olsen-Olsen, mg/kg	3	38	9	3	6.0	1.3	2.7	6.0	10
Ammonia as N, KCL Extract, mg/kg	13.2	2.4	1.0	<0.5	4.6	<1	2.4	1.4	69
NO3, mg/kg Dry	<1	<1	<1	<1	1460	487	1080	642	2.1
TKN, mg/kg	514	857	457	525	1500	490	1100	640	728
N-Total, mg/kg	520	-	-	-	<0.1	<0.1	<0.1	<0.1	730
B-CACL2, mg/kg	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Se-CACL2, mg/kg	<0.1	<0.1	<0.1	<0.1	<1	<1	<1	<1	<0.1
Ag-DTPA, mg/kg	<1	<1	<1	<1	84	7	75	8	<1
Al-DTPA, mg/kg	4	83	7	4	18	7	6	8	29
Cu-DTPA, mg/kg	5	4	3	3	101	65	82	94	4
Fe-DTPA, mg/kg	38	137	31	32	13	2	12	17	45
Mn-DTPA, mg/kg	12	5	1	1	<1	<1	<1	<1	4
Sb-DTPA, mg/kg	<1	<1	<1	<1	4	1	1	2	<1
Zn-DTPA, mg/kg	<1	1	<1	<1	-	-	-	-	<1
Ag, mg/kg-dry	-	-	-	-	-	-	-	-	-ND
Al, mg/kg-dry	-	-	-	-	-	-	-	-	16900
B, mg/kg-dry	-	-	-	-	-	-	-	-	<5
Ba, mg/kg-dry	-	-	-	-	-	-	-	-	127
Be, mg/kg-dry	-	-	-	-	-	-	-	-	<5
Ca, mg/kg-dry	-	-	-	-	-	-	-	-	1080
Cd, mg/kg-dry	-	-	-	-	-	-	-	-	<5
Co, mg/kg-dry	-	-	-	-	-	-	-	-	<1
Cr, mg/kg-dry	-	-	-	-	-	-	-	-	9
Cu, mg/kg-dry	-	-	-	-	-	-	-	-	<50
Fe, mg/kg-dry	-	-	-	-	-	-	-	-	13900
K, mg/kg-dry	-	-	-	-	-	-	-	-	1660
Mg, mg/kg-dry	-	-	-	-	-	-	-	-	3170
Mn, mg/kg-dry	-	-	-	-	-	-	-	-	172
Mo, mg/kg-dry	-	-	-	-	-	-	-	-	<5
Na, mg/kg-dry	-	-	-	-	-	-	-	-	186
Ni, mg/kg-dry	-	-	-	-	-	-	-	-	10
P, mg/kg-dry	-	-	-	-	-	-	-	-	507
Pb, mg/kg-dry	-	-	-	-	-	-	-	-	10
Se, mg/kg-dry	-	-	-	-	-	-	-	-	<5
Si, mg/kg-dry	-	-	-	-	-	-	-	-	479
Ti, mg/kg-dry	-	-	-	-	-	-	-	-	688
Tl, mg/kg-dry	-	-	-	-	-	-	-	-	<5
V, mg/kg-dry	-	-	-	-	-	-	-	-	20
Zn, mg/kg-dry	-	-	-	-	-	-	-	-	40
Density, g/cc	1.4	0.99	1.7	1.5	1.2	1.8	1.2	1.9	1.1
1/3 Bar Moisture, wt%	31	-	-	-	-	-	-	-	-
15 Bar-DRY, wt%	4.8	-	-	-	-	-	-	-	-

Knight Piésold CONSULTING

TABLE B.1

REVETT SILVER COMPANY
TROY MINE

TROY MINE TSF SOIL COVER - AVAILABLE TOPSOIL VOLUME AND COVER THICKNESS RECOMMENDATIONS
LABORATORY RESULTS - TOPSOIL STOCKPILES

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Laboratory Sample ID Knight Piésold Sample ID Matrix Type Sample Collection Date	H16050529-003 DH16-11-03-4-14 ft 5/19/2016	H16050511-002 DH16-12-02-1.5-4 ft Soil 5/18/2016	H16050511-003 DH16-12-03-4-10 ft Soil 5/18/2016	H16050511-004 DH16-12-04-10-16 ft Soil 5/18/2016	H16050510-001 DH16-13-01-0-1.5 ft Soil 5/17/2016	H16050510-003 DH16-13-03-4-12.5 ft Soil 5/17/2016	H16050508-011 DH16-14-02-1.5-4 ft Soil 5/18/2016	H16050529-006 DH16-15-03-4 ft-10 ft Soil 5/19/2016
Coarse Fragments, %	<2	13	<2	3	40	24	<2	4
Carbon Nitrogen Ratio	11.6	17.4	14.5	2.4	10.1	13.3	2.8	3.8
Moisture, wt %	21.3	25.0	26.9	21.1	10.1	14.4	14.5	20.1
Sand, %	30	40	16	2	50	44	16	9
Silt, %	61	48	72	88	38	43	76	82
Clay, %	9	12	12	10	12	13	8	9
Texture	SiL	L	SiL	Si	L	S	SiL	Si
pH 1:5, s_u_	-	-	-	-	-	-	-	-
pH-SatPst, s_u_	5.8	6.1	6.0	5.7	6.2	6.4	6.0	5.8
COND-SatPst, mmhos/cm	0.1	0.2	0.2	0.3	0.3	0.2	0.3	0.2
Ca-SatPst-Sat Paste, meq/L	0.53	0.56	0.39	0.89	1.04	0.64	1.29	0.79
Mg-SatPst-Sat Paste, meq/L	0.35	0.28	0.24	0.81	0.56	0.38	0.49	0.64
Na-SatPst-Sat Paste, meq/L	0.18	0.29	0.23	0.56	0.47	0.37	0.71	0.36
SAR, unitless	0.3	0.4	0.4	0.6	0.5	0.5	0.8	0.4
K-NH4OAC, mg/kg	65	122	120	45	124	164	47	42
OM-LOI, %	1.2	2.7	3.2	0.2	1.1	1.4	<0.2	0.3
0_5 in_ Rtnd, wt%-dry	0.2	4.6	< 0.1	< 0.1	8.9	5.8	< 0.1	1.9
No 4 Rtnd, wt%-dry	0.1	5.5	< 0.1	< 0.1	20.5	10.7	< 0.1	0.9
No 10 Rtnd, wt%-dry	1.2	3.0	1.3	2.7	11.1	7.4	< 0.1	0.9
No 20 Rtnd, wt%-dry	5.7	9.1	6.1	9.1	10.2	10.3	4.1	7.0
No 40 Rtnd, wt%-dry	11.1	12.5	8.9	7.0	8.1	10.2	5.6	7.8
No 60 Rtnd, wt%-dry	10.9	16.9	9.8	5.0	6.5	8.3	4.7	5.9
No 100 Rtnd, wt%-dry	7.5	8.7	8.0	4.5	7.0	10.6	5.8	4.9
No 200 Rtnd, wt%-dry	9.5	7.5	8.8	3.3	8.0	15.8	15.8	7.5
Pan, wt%-dry	53.7	32.2	57.1	68.4	19.7	20.9	63.9	63.3
Carbon, Total, %	0.6	1.5	1.5	0.1	0.6	0.7	0.2	0.2
P, Olsen-Olsen, mg/kg	11	14	16	5	23	26	2	4
Ammonia as N, KCL Extract, mg/kg	17.3	63	75	27	48	28	1.3	13.8
NO3, mg/kg Dry	<1	1.1	<1	<1	<1	<1	8.5	<1
TKN, mg/kg	538	875	1050	583	571	494	525	448
N-Total, mg/kg	540	880	1000	580	570	500	530	450
B-CACL2, mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Se-CACL2, mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ag-DTPA, mg/kg	<1	<1	<1	<1	<1	<1	<1	<1
Al-DTPA, mg/kg	25	43	47	3	34	20	4	2
Cu-DTPA, mg/kg	5	5	5	5	9	4	3	4
Fe-DTPA, mg/kg	123	147	213	99	77	150	34	75
Mn-DTPA, mg/kg	39	86	121	60	12	116	6	64
Sb-DTPA, mg/kg	<1	<1	<1	<1	<1	<1	<1	<1
Zn-DTPA, mg/kg	<1	1	1	<1	2	<1	<1	<1
Ag, mg/kg-dry	-ND	-	-	-	-	-	-	-ND
Al, mg/kg-dry	13800	-	-	-	-	-	-	13900
B, mg/kg-dry	<5	-	-	-	-	-	-	<5
Ba, mg/kg-dry	78	-	-	-	-	-	-	80
Be, mg/kg-dry	<5	-	-	-	-	-	-	<5
Ca, mg/kg-dry	933	-	-	-	-	-	-	710
Cd, mg/kg-dry	<5	-	-	-	-	-	-	<5
Co, mg/kg-dry	<1	-	-	-	-	-	-	<1
Cr, mg/kg-dry	13	-	-	-	-	-	-	10
Cu, mg/kg-dry	<50	-	-	-	-	-	-	<50
Fe, mg/kg-dry	13400	-	-	-	-	-	-	18600
K, mg/kg-dry	2090	-	-	-	-	-	-	2280
Mg, mg/kg-dry	3810	-	-	-	-	-	-	3720
Mn, mg/kg-dry	157	-	-	-	-	-	-	347
Mo, mg/kg-dry	<5	-	-	-	-	-	-	<5
Na, mg/kg-dry	90	-	-	-	-	-	-	70
Ni, mg/kg-dry	11	-	-	-	-	-	-	13
P, mg/kg-dry	288	-	-	-	-	-	-	145
Pb, mg/kg-dry	15	-	-	-	-	-	-	21
Se, mg/kg-dry	<5	-	-	-	-	-	-	<5
Si, mg/kg-dry	959	-	-	-	-	-	-	604
Ti, mg/kg-dry	472	-	-	-	-	-	-	484
Tl, mg/kg-dry	<5	-	-	-	-	-	-	<5
V, mg/kg-dry	15	-	-	-	-	-	-	17
Zn, mg/kg-dry	44	-	-	-	-	-	-	55
Density, g/cc	1.8	1.4	1.2	1.5	1.6	1.5	1.4	1.5
1/3 Bar Moisture, wt%	24	32	39	31	-	23	-	29
15 Bar-DRY, wt%	3.9	6.9	7.8	4.5	-	5.5	-	4.1

Knight Piésold
CONSULTING

TABLE B.2

REVETT SILVER COMPANY
TROY MINE

TROY MINE TSF SOIL COVER - AVAILABLE TOPSOIL VOLUME AND COVER THICKNESS RECOMMENDATIONS
LABORATORY RESULTS - TSF TEST PIT SAMPLING

Print Jul/15/16 16:17:02

Laboratory Sample ID	H16050422-001	H16050422-003	H16050335-002	H16050421-001	H16050423-001	H16050423-003	H16050524-001	H16050524-003	H16050531-002	H16050528-001	H16050527-001
Knight Piésold Sample ID	C1-TP16-01-05C	C1-TP16-12-16C	C1-TP16-23-28C	C2-TP16-01-07C	C2-TP16-15-21C	C2-TP16-27-32C	C3-TP16-01-06C	C3-TP16-13-17C	C3-TP16-24-29C	C4-TP16-01-05C	C4-TP16-11-15C
Matrix Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample Collection Date	5/14/2016	5/15/2016	5/15/2016	5/12/2016	5/12/2016	5/12/2016	5/20/2016	5/19/2016	5/20/2016	5/21/2016	5/22/2016
Coarse Fragments, %	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Carbon Nitrogen Ratio	2.4	2.8	3.4	5.0	2.4	3.3	3.6	3.4	3.3	3.4	3.2
Moisture, wt %	16.9	10.4	12.5	14.2	8.9	8.2	7.1	7.1	7.9	9.9	9.7
Sand, %	36	43	39	36	46	50	61	54	50	40	52
Silt, %	56	51	57	58	50	46	34	43	39	55	45
Clay, %	8	6	4	6	4	4	5	3	11	5	3
Texture	SiL	SiL	SiL	SiL	SiL	SL	SL	SL	L	SiL	SL
pH 1:5, s_u_	-	-	-	-	-	-	-	-	-	-	-
pH-SatPst, s_u_	8.2	8.3	8.2	8.4	8.2	8.1	8.1	8.0	8.1	8.4	8.3
COND-SatPst, mmhos/cm	0.3	0.2	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.2
Ca-SatPst-Sat Paste, meq/L	1.78	1.16	1.69	1.15	1.19	1.08	1.91	1.68	1.84	1.29	1.38
Mg-SatPst-Sat Paste, meq/L	0.63	0.44	0.55	0.47	0.41	0.37	0.67	0.52	0.61	0.43	0.43
Na-SatPst-Sat Paste, meq/L	0.59	0.26	0.44	0.75	0.29	0.19	0.30	0.21	0.21	0.18	0.25
SAR, unitless	0.5	0.3	0.4	0.8	0.3	0.2	0.3	0.2	0.2	0.2	0.3
K-NH4OAC, mg/kg	46	28	37	39	24	24	24	21	37	27	19
OM-WB, %	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	<0.2
0_5 in_ Rtnd, wt%-dry	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
No 4 Rtnd, wt%-dry	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
No 10 Rtnd, wt%-dry	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	0.2	0.1
No 20 Rtnd, wt%-dry	0.9	0.1	0.4	1.0	0.4	0.4	0.2	0.1	0.9	0.5	0.2
No 40 Rtnd, wt%-dry	1.9	0.5	1.0	1.7	0.5	0.5	0.2	0.4	0.8	0.5	0.1
No 60 Rtnd, wt%-dry	1.2	1.5	0.6	2.1	1.1	1.3	1.3	1.7	2.5	1.0	0.9
No 100 Rtnd, wt%-dry	6.9	6.2	5.9	8.2	15.6	30.0	32.4	23.2	28.0	9.7	13.5
No 200 Rtnd, wt%-dry	29.7	39.7	29.0	29.4	40.2	36.2	41.2	48.9	46.2	50.1	54.8
Pan, wt%-dry	59.4	52.0	63.1	57.6	42.3	31.7	24.6	25.6	21.4	38.0	30.4
Carbon, Total, %	0.1	0.1	0.1	0.2	<0.1	0.1	<0.1	<0.1	<0.1	0.1	0.1
P, Olsen-Olsen, mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Ammonia as N, KCL Extract, mg/kg	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<2	8.3	9.5	6.2	5.1
NO3, mg/kg Dry	1.1	<1	2.0	<1	<1	<1	<1	<1	<1	<1	<1
TKN, mg/kg	467	392	392	336	400	329	215	286	292	336	317
N-Total, mg/kg	470	390	390	340	400	330	220	290	290	340	320
B-CACL2, mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Se-CACL2, mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ag-DTPA, mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Al-DTPA, mg/kg	3	2	3	2	3	3	2	1	1	1	2
Cu-DTPA, mg/kg	68	62	54	56	63	41	57	86	79	48	43
Fe-DTPA, mg/kg	41	28	24	30	22	23	23	26	27	26	20
Mn-DTPA, mg/kg	12	8	9	11	7	6	8	7	9	11	10
Sb-DTPA, mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Zn-DTPA, mg/kg	3	3	3	3	2	1	<1	<1	<1	<1	1
Ag, mg/kg-dry	<5	<5	<5	<5	5	<5	<5	<5	-	<5	<5
Al, mg/kg-dry	1420	1780	1670	2430	1790	1720	1550	1420	-	1430	1110
B, mg/kg-dry	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5
Ba, mg/kg-dry	147	610	131	923	808	821	1350	1430	-	1670	1660
Be, mg/kg-dry	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5
Ca, mg/kg-dry	2330	2540	2670	2890	2390	2330	1500	1610	-	3240	2540
Cd, mg/kg-dry	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5
Co, mg/kg-dry	1	2	2	3	2	2	<1	<1	-	<1	<1
Cr, mg/kg-dry	11	12	13	16	12	11	9	11	-	12	12
Cu, mg/kg-dry	437	656	676	628	725	585	656	964	-	503	438
Fe, mg/kg-dry	3460	4940	4740	6140	5110	4920	3260	3430	-	3180	2590
K, mg/kg-dry	774	1090	976	1440	980	949	848	700	-	787	669
Mg, mg/kg-dry	578	734	718	957	821	793	558	525	-	640	483
Mn, mg/kg-dry	315	424	422	550	391	450	297	313	-	410	403
Mo, mg/kg-dry	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5
Na, mg/kg-dry	60	59	58	81	<50	<50	<50	<50	-	<50	<50
Ni, mg/kg-dry	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5
P, mg/kg-dry	62	91	80	95	100	99	98	95	-	95	80
Pb, mg/kg-dry	24	61	39	15	24	27	82	26	-	49	46
Se, mg/kg-dry	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5
Si, mg/kg-dry	150	225	209	211	190	208	426	277	-	289	268
Ti, mg/kg-dry	23	34	32	52	40	39	23	17	-	27	18
Tl, mg/kg-dry	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5
V, mg/kg-dry	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5
Zn, mg/kg-dry	10	18	16	18	14	16	10	9	-	9	9
Density, g/cc	1.4	1.4	1.1	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.4
1/3 Bar Moisture, wt%	21	19	20	22	17	16	12	15	17	20	16
15 Bar-DRY, wt%	1.3	1.1	1.1	1.3	0.92	0.92	0.67	0.66	1.1	0.63	0.48

I:\1\01\00280\12\A\Correspondence\NB16-00437 - Updated TSF Cover Thickness Recommendations\FINAL\Appendix B Lab Results\[Appendix B Lab Results.xlsx]B.2 TSF Test Pit Sampling

REV	DATE	DESCRIPTION	PREP'D	RVW'D
0	10AUG'16	ISSUED WITH MEMO NB16-00437	RM	SRA

Attachment B – Vegetation Sampling Data Summary Report, CDM Smith 2016

FINAL

Data Summary Report

Troy Mine Tailings Storage Facility
Embankment Vegetation Sampling

Troy, Montana

Prepared for:

Troy Mine, Inc.

December 15, 2016

CDM Smith

Table of Contents

List of Tables

List of Figures

Appendices

Acronyms

CDM Smith	CDM Smith Inc.
DSR	Data Summary Report
MDEQ	Montana Department of Environmental Quality
NOAEL	no observed adverse effect level
ROD	Record of Decision
SWP	Sampling Work Plan
TRV	toxicity reference value
TSF	Tailing Storage Facility
USEPA	United States Environmental Protection Agency

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Section 1
Introduction

CDM Smith Inc. (CDM Smith) was tasked by Troy Mine, Inc. to conduct sampling along the Troy Mine tailings storage facility (TSF) embankment. Troy Mine Inc. is committed to the successful and acceptable closure of the TSF and requested that CDM Smith collaborate with the Montana Department of Environmental Quality (MDEQ) for this sampling event. MDEQ provided valuable input with the review of the Sampling Work Plan (SWP), overseeing and participating in sampling efforts, and providing input on sample selection and analysis.

The Troy Mine TSF is located in Northwestern Montana, 10.5 miles south of Troy, MT along Highway 56. Figure 1 shows the site location within a general overview of northern Idaho and western Montana.

This Data Summary Report (DSR) summarizes the sampling, analyses, and results of the TSF sampling effort. The sampling was implemented in accordance with the SWP prepared for Troy Mine, Inc. by CDM Smith dated October 20, 2016 (CDM Smith 2016).

The following information is included in this DSR:

- Objectives of the investigation
- Discussion of the investigation
- Sampling and analysis summary
- Deviations from the SWP
- Conclusions and recommendations

The investigation was focused mainly on the lower lifts of the TSF which have been covered and successfully vegetated for 20-30 years, which has been acknowledged by MDEQ. A team of two field personnel were in the field from October 24, 2016 to October 27, 2016. For portions of the first two days, CDM Smith was accompanied by Patrick Plantenberg and John Koerth of MDEQ, who assisted with sampling location selection.

1.1 Investigation Objectives

The purpose of the sampling was to evaluate depth of cover soils, characteristics of cover soils (i.e., concentration of total metals, pH, organic matter content, soil texture analysis, cation exchange capacity, and redox potential), characteristics of underlying tailings, and the characteristics, including metal concentrations, of the vegetation growing on the soil cover. This was done to an extent which would determine if differences were observed between shallow cover (approximately 8 inches of soil) and deep cover (approximately 18 inches of soil) in terms of metals-uptake in the vegetation and the biological receptor risk associated with consumption of that vegetation.

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Section 2
Investigation Information

Investigation planning was performed to define the number of sample locations, approximate locations to be sampled, cover depths to be sampled, mediums to be sampled, and the analyses to be conducted.

2.1 Stating the Problem

In the Record of Decision (ROD), it is stated that the cover depth required for permanent closure of the TSF is 18-inches (USFS/MDEQ 2012). A study conducted by Knight Piesold (Knight Piesold 2016) shows that the available stockpiled soil volume will only provide 8- to 10-inches of cover. Therefore, it is necessary to determine if a cover depth less than 18-inches will be adequate.

2.2 Identify the Goal of the Study

Because the available soil will not cover the TSF to the required 18-inch depth, Troy Mine, Inc. wanted to understand whether a shallow soil cover would be capable of providing the same performance as the required cover depth.

2.3 Identify Information Inputs

Troy Mine, Inc. tasked CDM Smith with conducting sampling and evaluation of analytical results to determine if an 8-inch cover could perform at an equivalent level as the required 18-inch cover as stated in the ROD (USFS/MDEQ 2012). The sampling procedures and anticipated data needed were outlined in the SWP (CDM Smith 2016). The anticipated analyses to be conducted would define the total metals concentration in the vegetation samples. This information combined with the depth of the cover where the samples were located would allow for a statistical comparison between shallow and deep soil cover on the TSF. The total metals concentrations in the vegetation would also allow for a comparison to toxicity values presented in literature to estimate if risk with regard to biological receptors such as deer or the maximally exposed receptor, the meadow vole, is above a level of concern.

2.4 Define the Bounds of the Study

The primary area of the study was the lower lifts of the TSF as these locations were the areas with the oldest vegetation (20-30 years), which has had the longest time to accumulate metals. The samples collected atop the TSF were collected for a comparison of vegetation growing directly on tailings without cover soil. Both bounds of the study were developed in collaboration with MDEQ.

2.5 Define Analytic Approach

A two-sample hypothesis test can compare the parameters and distributions of two populations (e.g., vegetation collected from deep and shallow cover) based upon datasets collected from those populations. A Wilcoxon-Mann-Whitney (two-sided) test was performed using United States Environmental Protection Agency (USEPA)'s software, ProUCL (version 5.0). The Wilcoxon-

Mann-Whitney test was chosen as opposed to a T-test because it does not assume the data are normally or log-normally distributed, whereas a T-test does assume the data are normally or log-normally distributed. Non-normal distributions are typical of environmental data. A two-sided test can determine the comparability of two continuous data distributions by determining if the measures of the central locations (mean, median) of the two populations are significantly different.

Maximum concentrations of metals observed in the vegetation were compared to no observed adverse effect level (NOAEL) toxicity reference values (TRVs) as part of a screening evaluation to determine if concentrations of metals in vegetation pose a potential risk to ecological receptors anticipated to be present at the site.

Section 3
Field Sampling Summary and Results

This section summarizes field activities that were performed by CDM Smith in support of Troy Mine Inc.'s request to help assess the TSF cover and vegetation characteristics.

3.1 Overview

Following the initial tasking by Troy Mine, Inc., CDM Smith developed a draft SWP and solicited input from Troy Mine, Inc. and MDEQ. The SWP was finalized October 20, 2016 (CDM Smith 2016). Vegetation samples were sent to Energy Laboratories of Helena, Montana for analysis and results were received in mid-November 2016. An initial review of the data was conducted and it was determined that no additional samples would need to be analyzed as statistical significance had been achieved.

3.2 Test Pit Locations

In total 44 test pits were excavated by hand. These test pit locations were selected randomly by CDM Smith and MDEQ personnel while trying to maintain spatial variety across the site. All test pit locations were considered well vegetated. With MDEQ input, 30 of the test pit locations were selected for sampling, 15 of which represented the shallow cover depth while the remaining 15 represented the deep cover depth. Note that cover depth was measured perpendicular to the embankment slope. Figure 2 shows the test pit locations and the subset of locations that were sampled. Visible root structures were noted in both the tailings and the soils in multiple locations. Table 1 presents the hole number, cover soil depth, depth category, whether the location was sampled, whether the samples were analyzed, and root structure observations for all investigation locations.

3.2 Soil and Tailings Sampling

At each sampled test pit, a soil sample and a tailings sample were collected. After the test pit was excavated and immediately prior to collecting the samples, a shovel was decontaminated and was used to make a clean cut within the test pit exposing a fresh soil and tailings face for sampling. Sampling was completed wearing dedicated nitrile gloves for each individual sample. The gloves were discarded after sample collection. The samples were either collected by hand or with a decontaminated scooping tool and were placed in separate and individual plastic zip-top bags. In accordance with the SWP (CDM Smith 2016), the soil and tailings samples were not analyzed but were archived for future analysis if the need arises. In general, rocks with a diameter of ¾-inch or larger were discarded from the soil samples when observed.

3.3 Vegetation Sampling

At each sampled test pit, clippings from several grass (fescue) plants and needles from ponderosa pine trees were collected. The grass was clipped just above the root crown to avoid influencing the sample with entrained soil or tailings material. For each individual sample, sampling was completed wearing dedicated nitrile gloves which were discarded after sample collection. Grass

samples were collected using decontaminated sheers. Pine needle samples were collected with a gloved hand pulling live needles from the largest nearby Ponderosa tree (generally within 10-feet of the hole). The samples were placed in separate and individual plastic zip-top bags.

Fifteen (15) grass (fescue) samples were also collected on top of the TSF where there is no soil cover. This was completed on Cells 1, 2, and 3 where 5 samples were collected on each cell. The grass samples were collected in an identical fashion to those collected near the test pits. These locations are also shown on Figure 2. Grass collected from the tailings surface was knocked against the shears prior to bagging in an effort to remove tailings material that had splashed onto the vegetation surface. Due to the wet conditions, some tailings material was still adhered to the grass samples when bagged. The samples were submitted individually to the laboratory and were composited for each cell (e.g., all five samples from Cell 1 were composited by the laboratory into one composite sample representing Cell 1).

3.4 Results and Discussion

Vegetation samples for 8 shallow locations, 8 deep locations, and 15 samples from on top of the TSF were sent to the laboratory for total metals analysis. A visual estimation of plant canopy cover indicated that the cover was similar at the shallow and deep investigation locations. It was planned to collect more samples than were anticipated to be necessary for the statistical analysis. The unanalyzed samples were collected as a precaution, recognizing the difficulties which would come with additional sampling during the winter if the analyzed samples did not provide a large enough data set to determine statistical significance. The subset of samples selected for analysis focused on the extreme ends of the depth spectrum, with shallow cover of 6 to 8-inches and deep cover of 16 to 18-inchs. MDEQ was consulted on the selection of the limited subset of samples used for analysis. Because the analyzed subset provided sufficient confidence in the data, the additional vegetation, soil, and tailings samples have not been analyzed to date.

Locations of analyzed vegetation samples are shown in Figure 3. Table 2 summarizes the results of the total metals analysis performed on the subset of vegetation samples while Appendix A provides the analytical results reported by the laboratory. Figures 4, 5, 6, and 7 show the scatter plot data for copper, iron, manganese, and zinc detected in the samples. These four metals were detected in each analyzed vegetation sample. Silver, arsenic, cadmium, lead, antimony, and selenium were generally below detection limits. Boron was detected in some samples, but was excluded from the statistical analysis because detection is required in every sample for the statistical analysis.

The maximum observed metals values for copper, manganese, and zinc were compared to NOAEL TRVs (Sample et al. 1996) for two separate biologic receptors, the meadow vole (a small herbivore and the maximally exposed receptor) and the deer (a large herbivore). The NOAEL TRVs for the deer were adjusted to account for the area use factor (AUF) because it is not expected that the deer will only inhabit the area that the site comprises. The AUF for the deer is 0.53. This was determined by dividing the area of the site, 375 acres by the home range of the deer (705 acres). The total area of the site includes the exposed TSF surface as well as areas such as the property roadways, parking areas, and grassed area outside of the immediate TSF footprint. The NOAEL TRVs were divided by the AUF to make the adjustment. No adjustments were needed for the meadow vole because the home range for the meadow vole is less than the

area of the site. The NOAEL TRVs are also shown on Figures 4 through 7 and are summarized in Table 3. Table 3 also includes the maximum observed metals concentrations for vegetation on the embankment (shallow and deep cover data sets) and for vegetation on top of the tailings from this sampling event.

A two-sample hypothesis test was performed to compare the parameters and distributions of two populations (e.g., vegetation collected from deep and shallow cover) based upon datasets collected from those populations. A Wilcoxon-Mann-Whitney (two-sided) test was performed using USEPA's software, ProUCL (version 5.0). The Wilcoxon-Mann-Whitney test was chosen as opposed to a T-test because it does not assume the data are normally or log-normally distributed, whereas a T-test does assume the data are normally or log-normally distributed. Evaluation of the data reveals that they are not normally distributed which is typical of environmental data. A two-sided test was used to determine the comparability of two continuous data distributions by determining if the measures of the central locations (mean, median) of the two populations are significantly different.

Results for metals concentrations measured in needles and grass were combined for the statistical evaluation because concentrations were comparable as observed in Figure 4 through Figure 7. Mean levels of copper, iron, manganese, and zinc in vegetation collected from areas with deep and shallow cover were determined to be statistically equal based on a 95% confidence interval. These metals were evaluated in this statistical comparison because of their high detection frequency and/or because of their likelihood to cause ecological risk if present at high enough concentrations. The ProUCL output for the statistical comparison of the vegetation results for each metal is provided in Appendix B.

3.5 Deviations from Embankment Sampling Work Plan

The following are explanations for the deviations from the SWP.

The SWP stated that 20-30 locations representative of the lower lifts of the TSF embankment and shallow cover would be sampled. It also stated that some samples would be collected representative of a deeper soil cover. After consulting with MDEQ, it was decided that an equal number of samples representative of shallow and deep cover would provide a better comparison of the two cover depth categories.

Vegetation cover percentage was not determined for test pit locations, however photographs of test pit locations were collected prior to excavation. The percentage of cover was not specifically noted for each location as the locations were all generally well vegetated and lack of cover did not appear to be a concern. Successful vegetation of the TSF embankment has been acknowledged by MDEQ in the past. Select photographs from the sampling effort are provided in Appendix C and show the pre-excavation vegetation cover and the post sampling test pit face along with photographs of the TSF surface vegetation.

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Section 4
Conclusions and Recommendations

This section partially restates information provided previously in this DSR and presents the conclusions and recommendations which were drawn from the analyses performed.

Sampling and analysis of the Troy Mine TSF embankment cover was conducted by CDM Smith, in conjunction with MDEQ personnel, to determine whether shallow (8 inch) cover could perform comparably to a deep (18 inch) cover with respect to metals uptake in vegetation. Comparability of the two cover depths was assessed in terms of metals uptake in the vegetation of the TSF embankment. Additionally, the metals concentrations in vegetation were compared to NOAEL TRVs for biological receptors (meadow vole and deer) to evaluate whether shallow cover introduced a risk to biological receptors in the area. This task was undertaken because the current cover depth requirement for TSF closure is 18-inches but the stockpiled soil for TSF closure will only provide an 8- to 10-inch cover.

Although 30 locations on the embankment were sampled (i.e., 15 shallow and 15 deep), only vegetation samples from 16 locations (i.e., 8 shallow and 8 deep) were needed to provide statistical confidence in the dataset. The analysis showed that the measures of the central locations (mean) are statistically equivalent for the two data populations (i.e., shallow and deep cover) with regard to copper, iron, manganese, and zinc concentrations in the grass (fescue) and ponderosa pine tree needles.

The metals concentrations for copper, manganese, and zinc detected in the shallow and deep vegetation populations were observed well below the NOAEL TRVs for the maximally exposed biologic receptor, the meadow vole, as well as for the deer. This combined with the statistical equivalence of the data populations shows that they provide comparable safety to these receptors. Furthermore, since plant canopy cover was similar for areas with both shallow and deep cover soil, the soil erosion protection provided by the vegetation is expected to be similar across these areas.

With these measures accounted for, the alternative of placing an 8-inch soil cover over the TSF, as compared to an 18-inch soil cover, will provide a cover capable of supporting successful vegetation growth and equivalent safety to biologic receptors with regard to the consumption of vegetation growing on the TSF.

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Section 5
References

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Tables

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Table 1. Investigation Location Summary

Investigation Location	Depth to Tailings (inches)	Cover Depth Category (Deep/Shallow/NA)	Sampled (Yes/No)	Medium Collected (Soil/Tailings/Grass/Pine Needels/All Four/-)	Vegetation Sample Analyzed (Yes/No/-)	Root Structure Observations
Hole 01	No Tailings[1]	NA	No	-	-	-
Hole 02	10	Shallow	Yes	All Four	No	Tree roots in soil at interface with tailings
Hole 03	3	NA	No	-	-	-
Hole 04	4 to 12	NA	No	-	-	-
Hole 05	7	Shallow	Yes	All Four	Yes	Tree roots in soil; plug of soil in tailings possibly from root path
Hole 06	No Tailings[1]	NA	No	-	-	-
Hole 07	8	Shallow	Yes	All Four	Yes	Roots in soil and small roots in tailings
Hole 08	No Tailings[1]	NA	No	-	-	-
Hole 09	17	Deep	Yes	All Four	Yes	Roots in soil and tailings
Hole 10	14	Deep	Yes	All Four	No	Roots in soil and tailings
Hole 11	8	Shallow	Yes	All Four	No	Grass roots in soil
Hole 12	16	Deep	Yes	All Four	Yes	Grass roots in soil
Hole 13	6	Shallow	Yes	All Four	Yes	Grass and tree roots in soil; tree roots in tailings
Hole 14	16	Deep	Yes	All Four	Yes	Roots in soil at interface with tailings
Hole 15	16	Deep	Yes	All Four	Yes	Grass and tree roots in soil
Hole 16	No Tailings[1]	NA	No	-	-	-
Hole 17	14	Deep	Yes	All Four	No	Grass and tree roots in soil; tree roots in tailings
Hole 18	No Tailings[1]	NA	No	-	-	-
Hole 19	16	Deep	Yes	All Four	Yes	Grass and tree roots in soil
Hole 20	14	Deep	Yes	All Four	No	Grass and tree roots in soil; tree roots in tailings
Hole 21	9	Shallow	Yes	All Four	No	Many grass roots in soil

Table 1. Investigation Location Summary

Investigation Location	Depth to Tailings (inches)	Cover Depth Category (Deep/Shallow/NA)	Sampled (Yes/No)	Medium Collected (Soil/Tailings/Grass/Pine Needels/All Four/-)	Vegetation Sample Analyzed (Yes/No/-)	Root Structure Observations
Hole 22	16	Deep	Yes	All Four	Yes	Grass and tree roots in soil; tree roots in tailings
Hole 23	9	Shallow	Yes	All Four	No	Grass and tree roots in soil; tree roots in tailings
Hole 24	15	Deep	Yes	All Four	No	Grass and tree roots in soil; tree roots in tailings (appear to carry soil into tailings)
Hole 25	12	NA	No	-	-	-
Hole 26	12	NA	No	-	-	-
Hole 27	15	Deep	Yes	All Four	No	Roots in soil and at interface with tailings
Hole 28	18	Deep	Yes	All Four	Yes	Grass and tree roots in soil
Hole 29	No Tailings[1]	NA	No	-	-	-
Hole 30	15	Deep	Yes	All Four	No	Roots in soil and at interface with tailings
Hole 31	12 to 14	NA	No	-	-	-
Hole 32	9	Shallow	Yes	All Four	No	Grass and tree roots in soil
Hole 33	17	Deep	Yes	All Four	Yes	Grass and tree roots in soil; tree roots in tailings
Hole 34	6	Shallow	Yes	All Four	Yes	Roots in soil and at interface with tailings
Hole 35	No Tailings[1]	NA	No	-	-	-
Hole 36	No Tailings[1]	NA	No	-	-	-
Hole 37	7	Shallow	Yes	All Four	Yes	Grass and tree roots in soil
Hole 38	No Tailings[1]	NA	No	-	-	-
Hole 39	8	Shallow	Yes	All Four	Yes	Grass and tree roots in soil
Hole 40	14	Deep	Yes	All Four	No	Grass and tree roots in soil
Hole 41	8	Shallow	Yes	All Four	No	Grass and tree roots in soil; tree roots in tailings

Table 1. Investigation Location Summary

Investigation Location	Depth to Tailings (inches)	Cover Depth Category (Deep/Shallow/NA)	Sampled (Yes/No)	Medium Collected (Soil/Tailings/Grass/Pine Needels/All Four/-)	Vegetation Sample Analyzed (Yes/No/-)	Root Structure Observations
Hole 42	6	Shallow	Yes	All Four	Yes	Grass and tree roots in soil
Hole 43	9	Shallow	Yes	All Four	No	Grass and tree roots in soil; tree roots in tailings
Hole 44	7	Shallow	Yes	All Four	Yes	Large tree roots and grass roots in soil; tree roots in tailings
C1-G1	0	NA	Yes	Grass	Yes Composited at Lab	-
C1-G2	0	NA	Yes	Grass		-
C1-G3	0	NA	Yes	Grass		-
C1-G4	0	NA	Yes	Grass		-
C1-G5	0	NA	Yes	Grass		-
C2-G1	0	NA	Yes	Grass	Yes Composited at Lab	-
C2-G2	0	NA	Yes	Grass		-
C2-G3	0	NA	Yes	Grass		-
C2-G4	0	NA	Yes	Grass		-
C2-G5	0	NA	Yes	Grass		-
C3-G1	0	NA	Yes	Grass	Yes Composited at Lab	-
C3-G2	0	NA	Yes	Grass		-
C3-G3	0	NA	Yes	Grass		-
C3-G4	0	NA	Yes	Grass		-
C3-G5	0	NA	Yes	Grass		-

Note:

[1]Holes were excavated to 20-24 inches and no tailings were encountered.

Table 2. Analyzed Sample Results

Location	Depth to Tailings (inches)	Cover Depth Category	Sample ID	Media	Analysis	Total Metals Results (mg/kg-dry)										
					Total Metals[1]	Ag-T	As-T	B-T	Cd-T	Cu-T	Fe-T	Mn-T	Pb-T	Sb-T	Se-T	Zn-T
TSF Embankment	7	Shallow	H05-G	Grass	x	<1	<1	2	<1	14	339	81	1	<1	<1	16
			H05-N	Pine Needles	x	<1	<1	12	<1	4	43	90	<1	<1	<1	20
	8	Shallow	H07-G	Grass	x	<1	<1	2	<1	10	126	90	<1	<1	<1	24
			H07-N	Pine Needles	x	<1	<1	11	<1	3	43	170	<1	<1	<1	30
	17	Deep	H09-G	Grass	x	<1	<1	2	<1	5	82	135	<1	<1	<1	12
			H09-N	Pine Needles	x	<1	<1	11	<1	4	49	106	<1	<1	<1	25
	16	Deep	H12-G	Grass	x	<1	<1	1	<1	3	76	174	<1	<1	<1	14
			H12-N	Pine Needles	x	<1	<1	5	<1	3	80	137	<1	<1	<1	22
	6	Shallow	H13-G	Grass	x	<1	<1	<1	<1	2	55	311	<1	<1	<1	10
			H13-N	Pine Needles	x	<1	<1	7	<1	3	53	175	<1	<1	<1	28
	16	Deep	H14-G	Grass	x	<1	<1	1	<1	2	55	138	<1	<1	<1	16
			H14-N	Pine Needles	x	<1	<1	6	<1	3	88	161	<1	<1	<1	42
	16	Deep	H15-G	Grass	x	<1	<1	<1	<1	2	56	304	<1	<1	<1	11
			H15-N	Pine Needles	x	<1	<1	7	<1	4	94	272	<1	<1	<1	39
	16	Deep	H19-G	Grass	x	<1	<1	1	<1	4	66	157	<1	<1	<1	13
			H19-N	Pine Needles	x	<1	<1	11	<1	3	50	103	<1	<1	<1	26
	16	Deep	H22-G	Grass	x	<1	<1	2	<1	4	53	179	<1	<1	<1	25
			H22-N	Pine Needles	x	<1	<1	12	<1	3	67	108	<1	<1	<1	30
	18	Deep	H28-G	Grass	x	<1	<1	1	<1	3	57	180	<1	<1	<1	22
			H28-N	Pine Needles	x	<1	<1	12	<1	5	78	111	<1	<1	<1	27
	17	Deep	H33-G	Grass	x	<1	<1	2	<1	5	103	204	<1	<1	<1	14
			H33-N	Pine Needles	x	<1	<1	11	<1	3	88	158	<1	<1	<1	22
	6	Shallow	H34-G	Grass	x	<1	<1	2	<1	7	139	277	<1	<1	<1	21
			H34-N	Pine Needles	x	<1	<1	12	<1	3	61	208	<1	<1	<1	29
	7	Shallow	H37-G	Grass	x	<1	<1	2	<1	3	90	242	<1	<1	<1	15
			H37-N	Pine Needles	x	<1	<1	9	<1	3	58	202	<1	<1	<1	40
	8	Shallow	H39-G	Grass	x	<1	<1	1	<1	5	76	391	<1	<1	<1	18
			H39-N	Pine Needles	x	<1	<1	10	<1	3	57	199	<1	<1	<1	36
	6	Shallow	H42-G	Grass	x	<1	<1	2	<1	3	76	175	<1	<1	<1	19
			H42-N	Pine Needles	x	<1	<1	10	<1	3	72	122	<1	<1	<1	24
	7	Shallow	H44-G	Grass	x	<1	<1	2	<1	2	44	142	<1	<1	<1	24
			H44-N	Pine Needles	x	<1	<1	9	<1	3	82	159	<1	<1	<1	36
Top of TSF	0	None	C1-(G-1-G-5)	Grass	x[2]	<1	<1	3	<1	95	656	201	8	<1	<1	18
			C2-(G-1-G-5)	Grass	x[2]	<1	<1	2	<1	68	634	272	3	<1	<1	23
			C3-(G-1-G-5)	Grass	x[2]	<1	<1	2	<1	106	391	200	2	<1	<1	14

[1]Includes analysis for the following: Antimony, Arsenic, Boron, Cadmium, Copper, Iron, Lead, Manganese, Selenium, Silver, and Zinc

[2]Individual samples will be prepped and then composited prior to analysis.

Table 3. Comparison of NOAEL Values for the Meadow Vole and Deer with Maximum Observed Values for Copper, Manganese, and Zinc

Metal	Meadow Vole NOAEL[1] (mg/Kg)	Deer NOAEL[1,2] (mg/Kg)	Maximum Observed Concentration in Vegetation on Soil Cover[3] (mg/Kg)	Maximum Observed Concentration in Vegetation on Tailings (mg/Kg)
Copper (Cu)	225	262	14	106
Manganese (Mn)	1301	1513	391	272
Zinc (Zn)	2364	2750	42	23

[1]B.E. Sample, D.M. Opresko, G.W. Suter II. 1996. Toxicological Benchmarks for Wildlife 1996 Revision. June

[2]NOAEL for deer is based on area use factor (AUF) of 0.53 to account for home range of 705 acres.

[3]Represents the maximum for vegetation from the embankment regardless of shallow or deep cover category.

Figures

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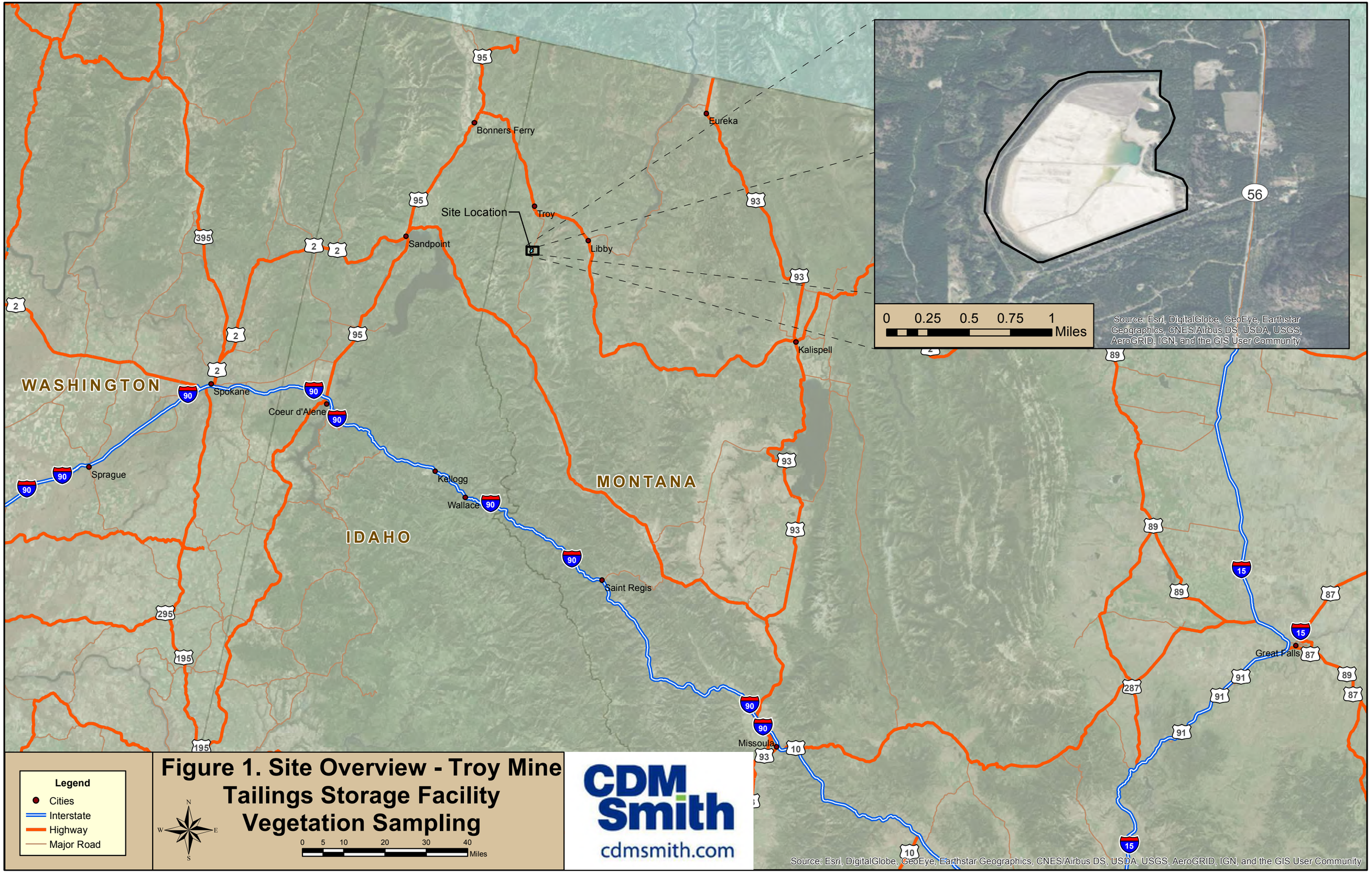

Figure 1. Site Overview - Troy Mine Tailings Storage Facility Vegetation Sampling

CDM Smith
cdmsmith.com

HOLE 12
HOLE 10
HOLE 11
HOLE 13
HOLE 14
HOLE 15
HOLE 08
HOLE 09
C2-G1
C2-G2
HOLE 44
HOLE 16
HOLE 17
C1-G5
C2-G3
C3-G1
HOLE 18
HOLE 20
HOLE 19
C2-G4
C2-G5
HOLE 07
HOLE 06
HOLE 43
C3-G2
C3-G3
C1-G4
HOLE 22
HOLE 21
C1-G3
HOLE 42
HOLE 04
HOLE 05
C3-G4
HOLE 24
HOLE 23
HOLE 39
HOLE 40
C1-G1
C1-G2
HOLE 41
HOLE 25
HOLE 27
HOLE 26
C3-G5
HOLE 03
HOLE 02
HOLE 28
HOLE 30
HOLE 29
HOLE 33
HOLE 32
HOLE 31
HOLE 34
HOLE 01
HOLE 37
HOLE 38
HOLE 36
HOLE 35

Legend

Locations

Depth Category

- Deep Cover (14"-18")
- Shallow Cover (6"-10")
- No Cover (0")
- Variable Cover Depth - Not Sampled

Figure 2. Troy Mine Tailings Storage Facility - Investigation Locations

0 187.5 375 750 1,125 1,500 Feet

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cdmsmith.com

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

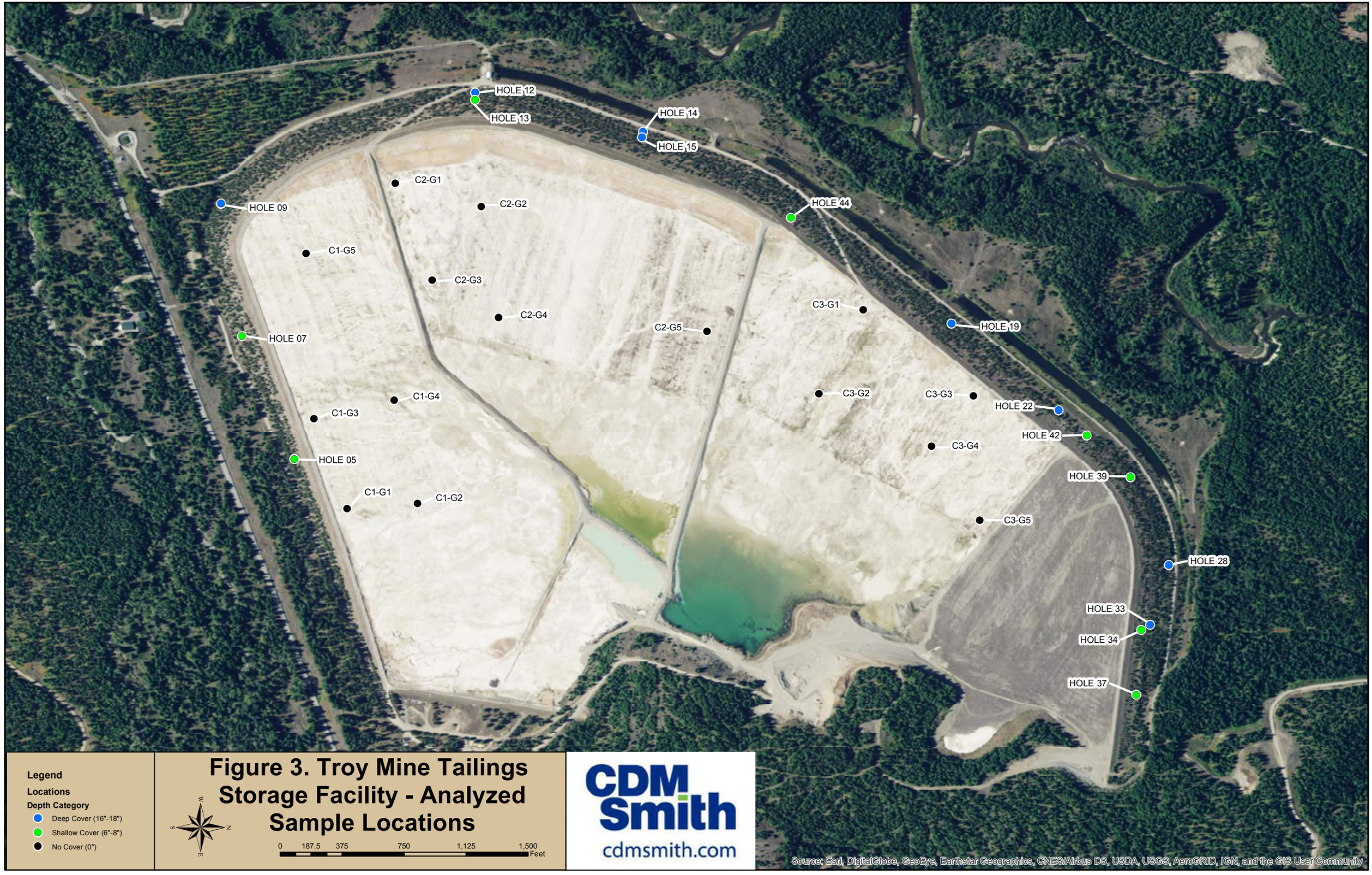
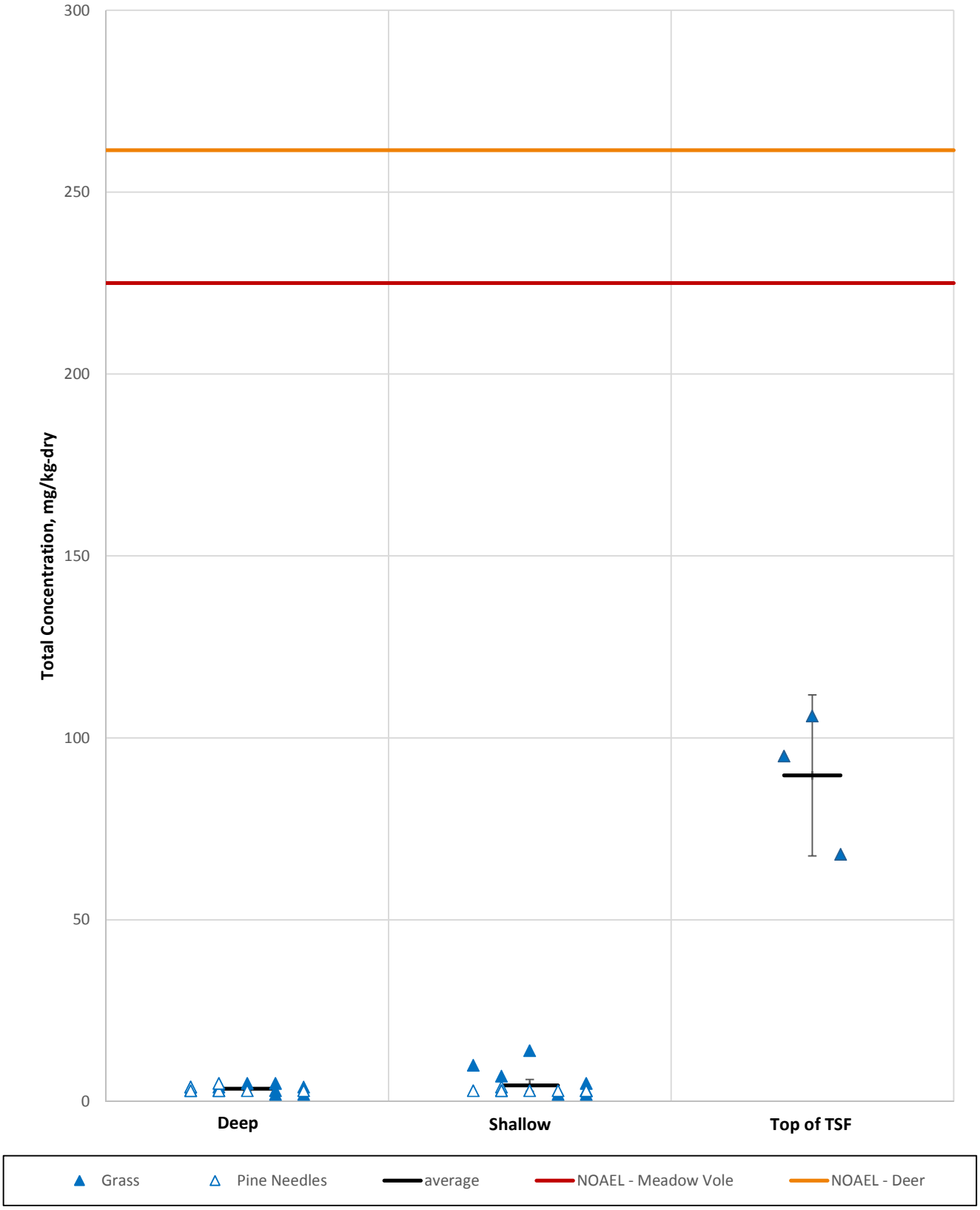
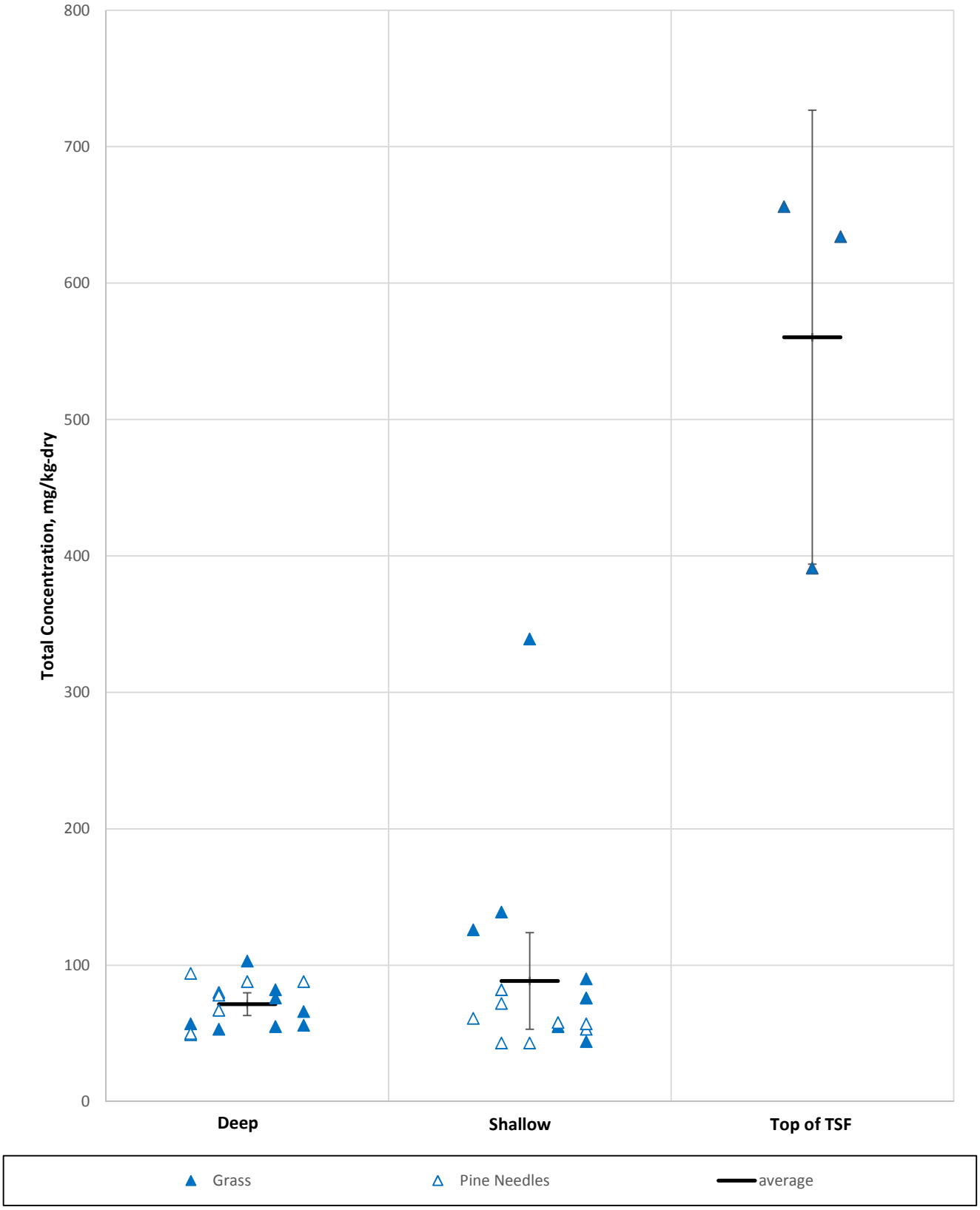

HOLE 12
HOLE 13
HOLE 14
HOLE 15
C2-G1
C2-G2
HOLE 09
HOLE 44
C1-G5
C2-G3
C2-G4
C3-G1
HOLE 19
C2-G5
HOLE 07
C1-G4
C3-G2
C3-G3
HOLE 22
C1-G3
HOLE 42
C3-G4
HOLE 05
HOLE 39
C1-G1
C1-G2
C3-G5
HOLE 28
HOLE 33
HOLE 34
HOLE 37
Legend
Locations
Depth Category
Deep Cover (16"-18")
Shallow Cover (6"-8")
No Cover (0")
W
E
S
N
0
187.5
375
750
1,125
1,500
Feet
Figure 3. Troy Mine Tailings Storage Facility - Analyzed Sample Locations
CDM Smith
cdmsmith.com
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Figure 4.
NOAEL Values Compared to Observed Copper Levels



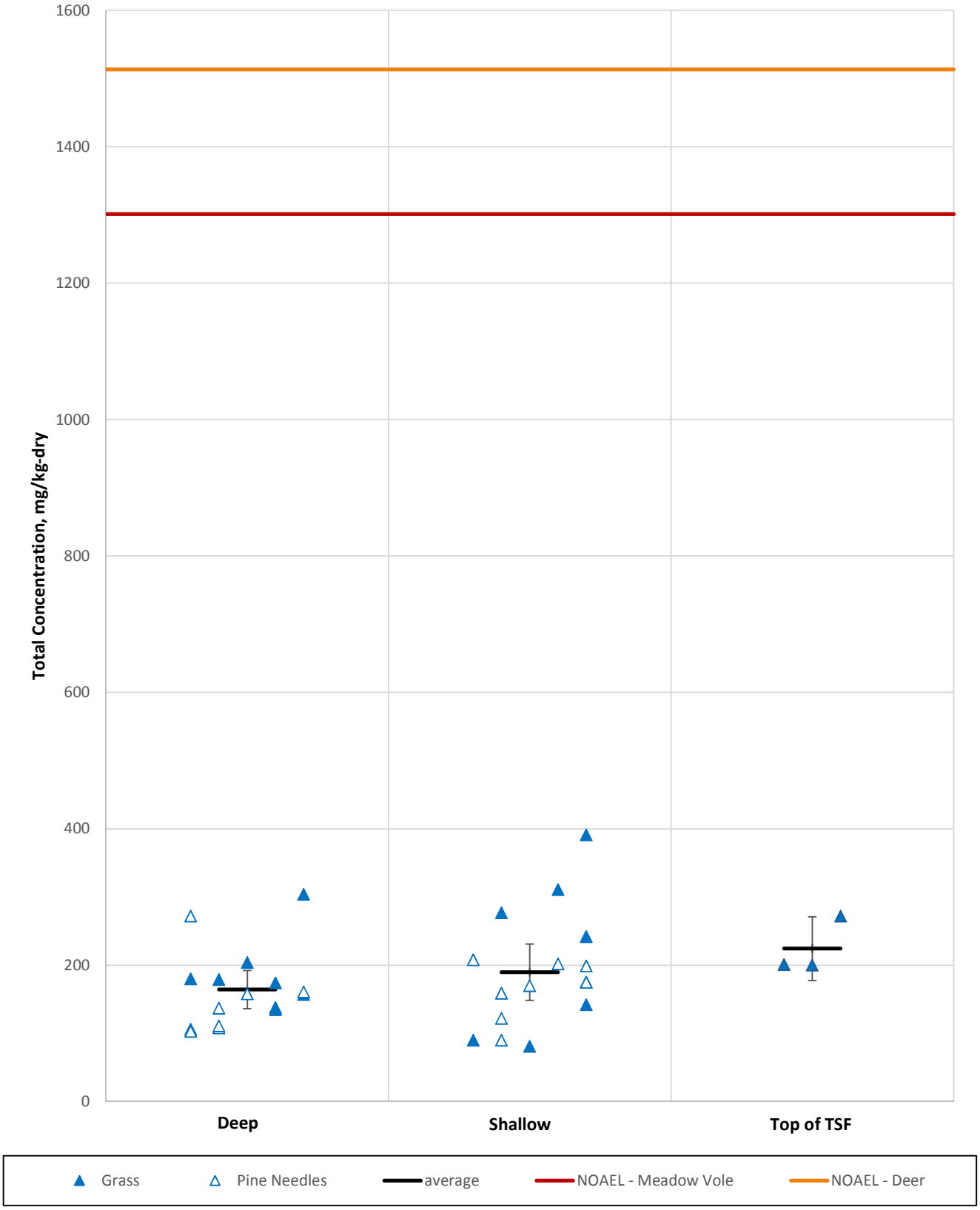
*Error bars represent the 95% confidence interval on the mean of the dataset.

Figure 5.
Observed Iron Levels



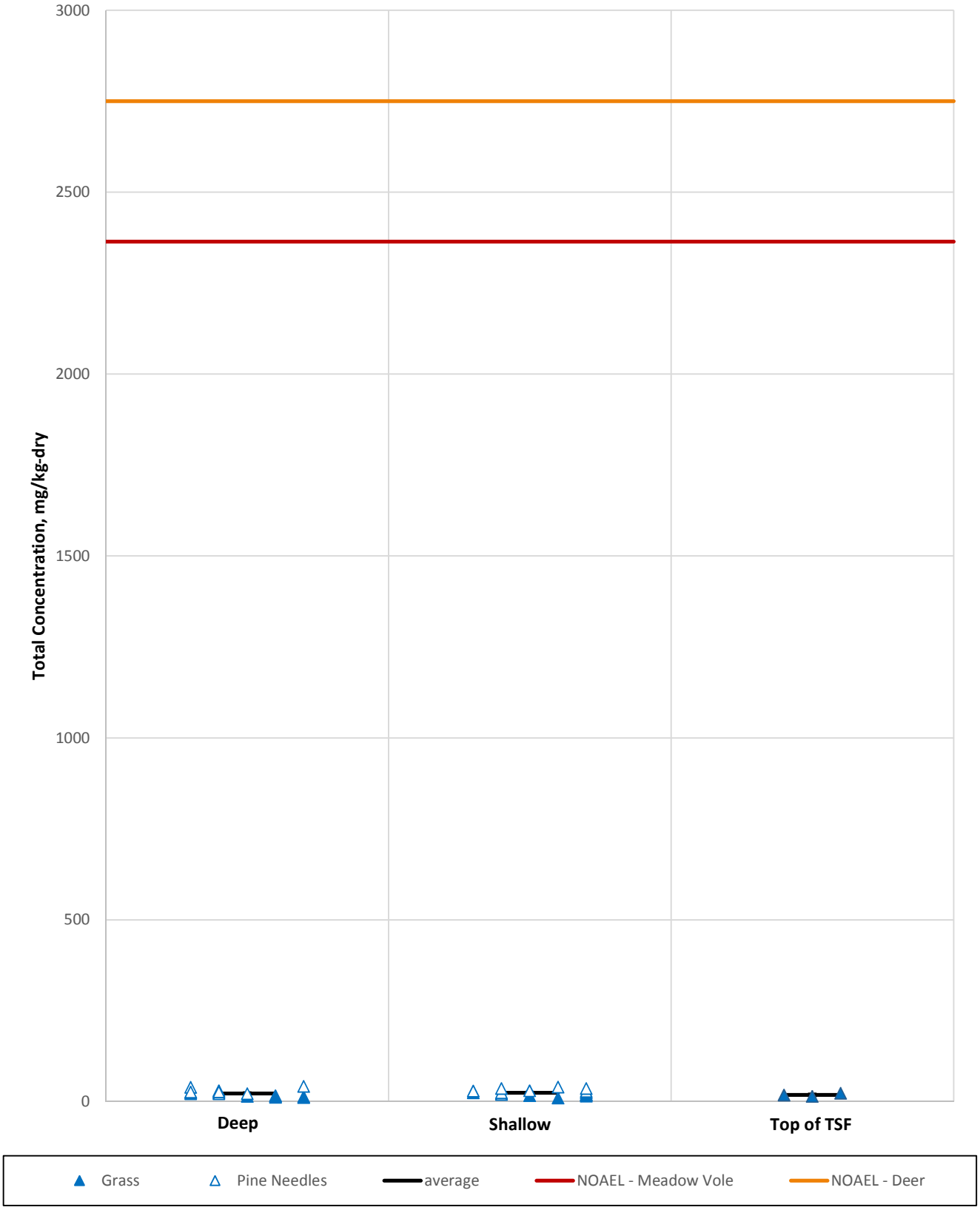
*Error bars represent the 95% confidence interval on the mean of the dataset.

Figure 6.
NOAEL Values Compared to Observed Manganese Levels



*Error bars represent the 95% confidence interval on the mean of the dataset.

Figure 7.
NOAEL Values Compared to Observed Zinc Levels



*Error bars represent the 95% confidence interval on the mean of the dataset.

Appendix A

Laboratory Results

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ANALYTICAL SUMMARY REPORT

November 22, 2016

Revett Silver Company
PO Box 1660
Troy, MT 59935-1660

Work Order: H16100582 Quote ID: H1336 - Soil sampling

Project Name: Troy Mining TSF Vegetation

Energy Laboratories Inc Helena MT received the following 120 samples for Revett Silver Company on 10/31/2016 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
H16100582-001	H02-S	10/25/16 13:40	10/31/16	Soil	Moisture
H16100582-002	H02-T	10/25/16 13:40	10/31/16	Soil	
H16100582-003	H02-G	10/25/16 13:40	10/31/16	Vegetation	Soil Preparation
H16100582-004	H02-N	10/25/16 13:40	10/31/16	Vegetation	Same As Above
H16100582-005	H05-S	10/25/16 14:05	10/31/16	Soil	Moisture
H16100582-006	H05-T	10/25/16 14:05	10/31/16	Soil	
H16100582-007	H05-G	10/25/16 14:05	10/31/16	Vegetation	Metals by ICP/ICPMS, Total Digestion, Total Metals Soil Preparation
H16100582-008	H05-N	10/25/16 14:05	10/31/16	Vegetation	Same As Above
H16100582-009	H07-S	10/25/16 14:36	10/31/16	Soil	Moisture
H16100582-010	H07-T	10/25/16 14:36	10/31/16	Soil	
H16100582-011	H07-G	10/25/16 14:36	10/31/16	Vegetation	Metals by ICP/ICPMS, Total Digestion, Total Metals Soil Preparation
H16100582-012	H07-N	10/25/16 14:36	10/31/16	Vegetation	Same As Above
H16100582-013	H09-S	10/25/16 15:08	10/31/16	Soil	Moisture
H16100582-014	H09-T	10/25/16 15:08	10/31/16	Soil	
H16100582-015	H09-G	10/25/16 15:08	10/31/16	Vegetation	Metals by ICP/ICPMS, Total Digestion, Total Metals Soil Preparation
H16100582-016	H09-N	10/25/16 15:08	10/31/16	Vegetation	Same As Above
H16100582-017	H10-S	10/25/16 15:38	10/31/16	Soil	Moisture
H16100582-018	H10-T	10/25/16 15:38	10/31/16	Soil	
H16100582-019	H10-G	10/25/16 15:38	10/31/16	Vegetation	Soil Preparation
H16100582-020	H10-N	10/25/16 15:38	10/31/16	Vegetation	Same As Above
H16100582-021	H11-S	10/25/16 16:00	10/31/16	Soil	Moisture
H16100582-022	H11-T	10/25/16 16:00	10/31/16	Soil	
H16100582-023	H11-G	10/25/16 16:00	10/31/16	Vegetation	Soil Preparation
H16100582-024	H11-N	10/25/16 16:00	10/31/16	Vegetation	Same As Above

ANALYTICAL SUMMARY REPORT

H16100582-025	H12-S	10/25/16 16:35	10/31/16	Soil	Moisture
H16100582-026	H12-T	10/25/16 15:35	10/31/16	Soil	
H16100582-027	H12-G	10/25/16 16:35	10/31/16	Vegetation	Metals by ICP/ICPMS, Total Digestion, Total Metals Soil Preparation
H16100582-028	H12-N	10/25/16 16:35	10/31/16	Vegetation	Same As Above
H16100582-029	H13-S	10/25/16 17:00	10/31/16	Soil	Moisture
H16100582-030	H13-T	10/25/16 17:00	10/31/16	Soil	
H16100582-031	H13-G	10/25/16 17:00	10/31/16	Vegetation	Metals by ICP/ICPMS, Total Digestion, Total Metals Soil Preparation
H16100582-032	H13-N	10/25/16 17:00	10/31/16	Vegetation	Same As Above
H16100582-033	H14-S	10/25/16 17:30	10/31/16	Soil	Moisture
H16100582-034	H14-T	10/25/16 17:30	10/31/16	Soil	
H16100582-035	H14-G	10/25/16 17:30	10/31/16	Vegetation	Metals by ICP/ICPMS, Total Digestion, Total Metals Soil Preparation
H16100582-036	H14-N	10/25/16 17:30	10/31/16	Vegetation	Same As Above
H16100582-037	H15-S	10/25/16 17:52	10/31/16	Soil	Moisture
H16100582-038	H15-T	10/25/16 17:52	10/31/16	Soil	
H16100582-039	H15-G	10/25/16 17:52	10/31/16	Vegetation	Metals by ICP/ICPMS, Total Digestion, Total Metals Soil Preparation
H16100582-040	H15-N	10/25/16 17:52	10/31/16	Vegetation	Same As Above
H16100582-041	H17-S	10/26/16 10:04	10/31/16	Soil	Moisture
H16100582-042	H17-T	10/26/16 10:04	10/31/16	Soil	
H16100582-043	H17-G	10/26/16 10:04	10/31/16	Vegetation	Soil Preparation
H16100582-044	H17-N	10/26/16 10:04	10/31/16	Vegetation	Same As Above
H16100582-045	H19-S	10/26/16 10:35	10/31/16	Soil	Moisture
H16100582-046	H19-T	10/26/16 10:35	10/31/16	Soil	
H16100582-047	H19-G	10/26/16 10:35	10/31/16	Vegetation	Metals by ICP/ICPMS, Total Digestion, Total Metals Soil Preparation
H16100582-048	H19-N	10/26/16 10:35	10/31/16	Vegetation	Same As Above
H16100582-049	H20-S	10/26/16 11:00	10/31/16	Soil	Moisture
H16100582-050	H20-T	10/26/16 11:00	10/31/16	Soil	
H16100582-051	H20-G	10/26/16 11:00	10/31/16	Vegetation	Soil Preparation
H16100582-052	H20-N	10/26/16 11:00	10/31/16	Vegetation	Same As Above
H16100582-053	H21-S	10/26/16 11:30	10/31/16	Soil	Moisture
H16100582-054	H21-T	10/26/16 11:30	10/31/16	Soil	
H16100582-055	H21-G	10/26/16 11:30	10/31/16	Vegetation	Soil Preparation

ANALYTICAL SUMMARY REPORT

H16100582-056	H21-N	10/26/16 11:30	10/31/16	Vegetation	Same As Above
H16100582-057	H22-S	10/26/16 11:55	10/31/16	Soil	Moisture
H16100582-058	H22-T	10/26/16 11:35	10/31/16	Soil	
H16100582-059	H22-G	10/26/16 11:35	10/31/16	Vegetation	Metals by ICP/ICPMS, Total Digestion, Total Metals Soil Preparation
H16100582-060	H22-N	10/26/16 11:35	10/31/16	Vegetation	Same As Above
H16100582-061	H23-S	10/26/16 14:01	10/31/16	Soil	Moisture
H16100582-062	H23-T	10/26/16 14:01	10/31/16	Soil	
H16100582-063	H23-G	10/26/16 14:01	10/31/16	Vegetation	Soil Preparation
H16100582-064	H23-N	10/26/16 14:01	10/31/16	Vegetation	Same As Above
H16100582-065	H24-S	10/26/16 13:45	10/31/16	Soil	Moisture
H16100582-066	H24-T	10/26/16 13:45	10/31/16	Soil	
H16100582-067	H24-G	10/26/16 13:45	10/31/16	Vegetation	Soil Preparation
H16100582-068	H24-N	10/26/16 13:45	10/31/16	Vegetation	Same As Above
H16100582-069	H27-S	10/26/16 15:50	10/31/16	Soil	Moisture
H16100582-070	H27-T	10/26/16 15:50	10/31/16	Soil	
H16100582-071	H27-G	10/26/16 15:50	10/31/16	Vegetation	Soil Preparation
H16100582-072	H27-N	10/26/16 15:50	10/31/16	Vegetation	Same As Above
H16100582-073	H28-S	10/26/16 16:15	10/31/16	Soil	Moisture
H16100582-074	H28-T	10/26/16 16:15	10/31/16	Soil	
H16100582-075	H28-G	10/26/16 16:15	10/31/16	Vegetation	Metals by ICP/ICPMS, Total Digestion, Total Metals Soil Preparation
H16100582-076	H28-N	10/26/16 16:15	10/31/16	Vegetation	Same As Above
H16100582-077	H30-S	10/26/16 16:40	10/31/16	Soil	Moisture
H16100582-078	H30-T	10/26/16 16:40	10/31/16	Soil	
H16100582-079	H30-G	10/26/16 16:40	10/31/16	Vegetation	Soil Preparation
H16100582-080	H30-N	10/26/16 16:40	10/31/16	Vegetation	Same As Above
H16100582-081	H32-S	10/26/16 17:48	10/31/16	Soil	Moisture
H16100582-082	H32-T	10/26/16 16:48	10/31/16	Soil	
H16100582-083	H32-G	10/26/16 17:48	10/31/16	Vegetation	Soil Preparation
H16100582-084	H32-N	10/26/16 17:48	10/31/16	Vegetation	Same As Above
H16100582-085	H33-S	10/26/16 18:05	10/31/16	Soil	Moisture
H16100582-086	H33-T	10/26/16 18:05	10/31/16	Soil	
H16100582-087	H33-G	10/26/16 18:05	10/31/16	Vegetation	Metals by ICP/ICPMS, Total Digestion, Total Metals Soil Preparation

ANALYTICAL SUMMARY REPORT

H16100582-088	H33-N	10/26/16 18:05	10/31/16	Vegetation	Same As Above
H16100582-089	H34-S	10/26/16 18:20	10/31/16	Soil	Moisture
H16100582-090	H34-T	10/26/16 18:20	10/31/16	Soil	
H16100582-091	H34-G	10/26/16 18:20	10/31/16	Vegetation	Metals by ICP/ICPMS, Total Digestion, Total Metals Soil Preparation
H16100582-092	H34-N	10/26/16 18:20	10/31/16	Vegetation	Same As Above
H16100582-093	H37-S	10/26/16 17:15	10/31/16	Soil	Moisture
H16100582-094	H37-T	10/26/16 17:15	10/31/16	Soil	
H16100582-095	H37-G	10/26/16 17:15	10/31/16	Vegetation	Metals by ICP/ICPMS, Total Digestion, Total Metals Soil Preparation
H16100582-096	H37-N	10/26/16 17:15	10/31/16	Vegetation	Same As Above
H16100582-097	H39-S	10/26/16 14:50	10/31/16	Soil	Moisture
H16100582-098	H39-T	10/26/16 14:50	10/31/16	Soil	
H16100582-099	H39-G	10/26/16 14:50	10/31/16	Vegetation	Metals by ICP/ICPMS, Total Digestion, Total Metals Soil Preparation
H16100582-100	H39-N	10/26/16 14:50	10/31/16	Vegetation	Same As Above
H16100582-101	H40-S	10/26/16 14:30	10/31/16	Soil	Moisture
H16100582-102	H40-T	10/26/16 14:30	10/31/16	Soil	
H16100582-103	H40-G	10/26/16 14:30	10/31/16	Vegetation	Soil Preparation
H16100582-104	H40-N	10/26/16 14:30	10/31/16	Vegetation	Same As Above
H16100582-105	H41-S	10/26/16 15:20	10/31/16	Soil	Moisture
H16100582-106	H41-T	10/26/16 15:20	10/31/16	Soil	
H16100582-107	H41-G	10/26/16 15:20	10/31/16	Vegetation	Soil Preparation
H16100582-108	H41-N	10/26/16 15:20	10/31/16	Vegetation	Same As Above
H16100582-109	H42-S	10/26/16 13:00	10/31/16	Soil	Moisture
H16100582-110	H42-T	10/26/16 13:00	10/31/16	Soil	
H16100582-111	H42-G	10/26/16 13:00	10/31/16	Vegetation	Metals by ICP/ICPMS, Total Digestion, Total Metals Soil Preparation
H16100582-112	H42-N	10/26/16 13:00	10/31/16	Vegetation	Same As Above
H16100582-113	H43-S	10/26/16 12:30	10/31/16	Soil	Moisture
H16100582-114	H43-T	10/26/16 12:30	10/31/16	Soil	
H16100582-115	H43-G	10/26/16 12:30	10/31/16	Vegetation	Soil Preparation
H16100582-116	H43-N	10/26/16 12:30	10/31/16	Vegetation	Same As Above
H16100582-117	H44-S	10/25/16 17:25	10/31/16	Soil	Moisture
H16100582-118	H44-T	10/25/16 18:25	10/31/16	Soil	

ANALYTICAL SUMMARY REPORT

H16100582-119	H44-G	10/25/16 18:25	10/31/16	Vegetation	Metals by ICP/ICPMS, Total Digestion, Total Metals Soil Preparation
H16100582-120	H44-N	10/25/16 18:25	10/31/16	Vegetation	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 3161 E. Lyndale Ave., Helena, MT 59604, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

The results as reported relate only to the item(s) submitted for testing.

If you have any questions regarding these test results, please call.

Report Approved By:

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-001
Client Sample ID: H02-S

Report Date: 11/22/16
Collection Date: 10/25/16 13:40
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	19.6	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-005
Client Sample ID: H05-S

Report Date: 11/22/16
Collection Date: 10/25/16 14:05
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	17.2	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-007
Client Sample ID: H05-G

Report Date: 11/22/16
Collection Date: 10/25/16 14:05
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/11/16 15:34 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/11/16 15:34 / dck
Boron	2	mg/kg-dry		1		SW6010B	11/10/16 17:49 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/11/16 15:34 / dck
Copper	14	mg/kg-dry		1		SW6010B	11/08/16 09:50 / sld
Iron	339	mg/kg-dry		5		SW6010B	11/08/16 09:50 / sld
Lead	1	mg/kg-dry		1		SW6020	11/11/16 15:34 / dck
Manganese	81	mg/kg-dry		1		SW6010B	11/08/16 09:50 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/11/16 15:34 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/11/16 15:34 / dck
Zinc	16	mg/kg-dry		1		SW6010B	11/08/16 09:50 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-008
Client Sample ID: H05-N

Report Date: 11/22/16
Collection Date: 10/25/16 14:05
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/11/16 15:38 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/11/16 15:38 / dck
Boron	12	mg/kg-dry		1		SW6010B	11/08/16 09:54 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/11/16 15:38 / dck
Copper	4	mg/kg-dry		1		SW6010B	11/08/16 09:54 / sld
Iron	43	mg/kg-dry		5		SW6010B	11/08/16 09:54 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/11/16 15:38 / dck
Manganese	90	mg/kg-dry		1		SW6010B	11/08/16 09:54 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/11/16 15:38 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/11/16 15:38 / dck
Zinc	20	mg/kg-dry		1		SW6010B	11/08/16 09:54 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-009
Client Sample ID: H07-S

Report Date: 11/22/16
Collection Date: 10/25/16 14:36
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	22.6	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-011
Client Sample ID: H07-G

Report Date: 11/22/16
Collection Date: 10/25/16 14:36
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/11/16 15:41 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/11/16 15:41 / dck
Boron	2	mg/kg-dry		1		SW6010B	11/10/16 17:53 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/11/16 15:41 / dck
Copper	10	mg/kg-dry		1		SW6010B	11/08/16 09:58 / sld
Iron	126	mg/kg-dry		5		SW6010B	11/08/16 09:58 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/11/16 15:41 / dck
Manganese	90	mg/kg-dry		1		SW6010B	11/08/16 09:58 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/11/16 15:41 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/11/16 15:41 / dck
Zinc	24	mg/kg-dry		1		SW6010B	11/08/16 09:58 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-012
Client Sample ID: H07-N

Report Date: 11/22/16
Collection Date: 10/25/16 14:36
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/11/16 15:44 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/11/16 15:44 / dck
Boron	11	mg/kg-dry		1		SW6010B	11/08/16 10:01 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/11/16 15:44 / dck
Copper	3	mg/kg-dry		1		SW6010B	11/08/16 10:01 / sld
Iron	43	mg/kg-dry		5		SW6010B	11/08/16 10:01 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/11/16 15:44 / dck
Manganese	170	mg/kg-dry		1		SW6010B	11/08/16 10:01 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/11/16 15:44 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/11/16 15:44 / dck
Zinc	30	mg/kg-dry		1		SW6010B	11/08/16 10:01 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-013
Client Sample ID: H09-S

Report Date: 11/22/16
Collection Date: 10/25/16 15:08
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	13.3	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-015
Client Sample ID: H09-G

Report Date: 11/22/16
Collection Date: 10/25/16 15:08
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/11/16 15:48 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/11/16 15:48 / dck
Boron	2	mg/kg-dry		1		SW6010B	11/10/16 17:57 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/11/16 15:48 / dck
Copper	5	mg/kg-dry		1		SW6010B	11/08/16 10:05 / sld
Iron	82	mg/kg-dry		5		SW6010B	11/08/16 10:05 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/11/16 15:48 / dck
Manganese	135	mg/kg-dry		1		SW6010B	11/08/16 10:05 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/11/16 15:48 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/11/16 15:48 / dck
Zinc	12	mg/kg-dry		1		SW6010B	11/08/16 10:05 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-016
Client Sample ID: H09-N

Report Date: 11/22/16
Collection Date: 10/25/16 15:08
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/11/16 15:51 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/11/16 15:51 / dck
Boron	11	mg/kg-dry		1		SW6010B	11/08/16 10:09 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/11/16 15:51 / dck
Copper	4	mg/kg-dry		1		SW6010B	11/08/16 10:09 / sld
Iron	49	mg/kg-dry		5		SW6010B	11/08/16 10:09 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/11/16 15:51 / dck
Manganese	106	mg/kg-dry		1		SW6010B	11/08/16 10:09 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/11/16 15:51 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/11/16 15:51 / dck
Zinc	25	mg/kg-dry		1		SW6010B	11/08/16 10:09 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-017
Client Sample ID: H10-S

Report Date: 11/22/16
Collection Date: 10/25/16 15:38
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	19.5	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-021
Client Sample ID: H11-S

Report Date: 11/22/16
Collection Date: 10/25/16 16:00
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	15.9	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-025
Client Sample ID: H12-S

Report Date: 11/22/16
Collection Date: 10/25/16 16:35
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	18.2	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-027
Client Sample ID: H12-G

Report Date: 11/22/16
Collection Date: 10/25/16 16:35
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/11/16 16:08 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/11/16 16:08 / dck
Boron	1	mg/kg-dry		1		SW6010B	11/10/16 18:00 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/11/16 16:08 / dck
Copper	3	mg/kg-dry		1		SW6010B	11/08/16 10:13 / sld
Iron	76	mg/kg-dry		5		SW6010B	11/08/16 10:13 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/11/16 16:08 / dck
Manganese	174	mg/kg-dry		1		SW6010B	11/08/16 10:13 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/11/16 16:08 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/11/16 16:08 / dck
Zinc	14	mg/kg-dry		1		SW6010B	11/08/16 10:13 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-028
Client Sample ID: H12-N

Report Date: 11/22/16
Collection Date: 10/25/16 16:35
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/11/16 16:11 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/11/16 16:11 / dck
Boron	5	mg/kg-dry		1		SW6010B	11/08/16 10:16 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/11/16 16:11 / dck
Copper	3	mg/kg-dry		1		SW6010B	11/08/16 10:16 / sld
Iron	80	mg/kg-dry		5		SW6010B	11/08/16 10:16 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/11/16 16:11 / dck
Manganese	137	mg/kg-dry		1		SW6010B	11/08/16 10:16 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/11/16 16:11 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/11/16 16:11 / dck
Zinc	22	mg/kg-dry		1		SW6010B	11/08/16 10:16 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-029
Client Sample ID: H13-S

Report Date: 11/22/16
Collection Date: 10/25/16 17:00
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	22.5	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-031
Client Sample ID: H13-G

Report Date: 11/22/16
Collection Date: 10/25/16 17:00
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/11/16 16:14 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/11/16 16:14 / dck
Boron	ND	mg/kg-dry		1		SW6010B	11/10/16 18:04 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/11/16 16:14 / dck
Copper	2	mg/kg-dry		1		SW6010B	11/08/16 10:20 / sld
Iron	55	mg/kg-dry		5		SW6010B	11/08/16 10:20 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/11/16 16:14 / dck
Manganese	311	mg/kg-dry		1		SW6010B	11/08/16 10:20 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/11/16 16:14 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/11/16 16:14 / dck
Zinc	10	mg/kg-dry		1		SW6010B	11/08/16 10:20 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-032
Client Sample ID: H13-N

Report Date: 11/22/16
Collection Date: 10/25/16 17:00
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/11/16 16:18 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/11/16 16:18 / dck
Boron	7	mg/kg-dry		1		SW6010B	11/08/16 10:31 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/11/16 16:18 / dck
Copper	3	mg/kg-dry		1		SW6010B	11/08/16 10:31 / sld
Iron	53	mg/kg-dry		5		SW6010B	11/08/16 10:31 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/11/16 16:18 / dck
Manganese	175	mg/kg-dry		1		SW6010B	11/08/16 10:31 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/11/16 16:18 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/11/16 16:18 / dck
Zinc	28	mg/kg-dry		1		SW6010B	11/08/16 10:31 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-033
Client Sample ID: H14-S

Report Date: 11/22/16
Collection Date: 10/25/16 17:30
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	14.5	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-035
Client Sample ID: H14-G

Report Date: 11/22/16
Collection Date: 10/25/16 17:30
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/11/16 16:21 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/11/16 16:21 / dck
Boron	1	mg/kg-dry		1		SW6010B	11/10/16 18:15 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/11/16 16:21 / dck
Copper	2	mg/kg-dry		1		SW6010B	11/08/16 10:35 / sld
Iron	55	mg/kg-dry		5		SW6010B	11/08/16 10:35 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/11/16 16:21 / dck
Manganese	138	mg/kg-dry		1		SW6010B	11/08/16 10:35 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/11/16 16:21 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/11/16 16:21 / dck
Zinc	16	mg/kg-dry		1		SW6010B	11/08/16 10:35 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-036
Client Sample ID: H14-N

Report Date: 11/22/16
Collection Date: 10/25/16 17:30
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/11/16 16:24 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/11/16 16:24 / dck
Boron	6	mg/kg-dry		1		SW6010B	11/08/16 10:38 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/11/16 16:24 / dck
Copper	3	mg/kg-dry		1		SW6010B	11/08/16 10:38 / sld
Iron	88	mg/kg-dry		5		SW6010B	11/08/16 10:38 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/11/16 16:24 / dck
Manganese	161	mg/kg-dry		1		SW6010B	11/08/16 10:38 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/11/16 16:24 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/11/16 16:24 / dck
Zinc	42	mg/kg-dry		1		SW6010B	11/08/16 10:38 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-037
Client Sample ID: H15-S

Report Date: 11/22/16
Collection Date: 10/25/16 17:52
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	21.7	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-039
Client Sample ID: H15-G

Report Date: 11/22/16
Collection Date: 10/25/16 17:52
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/11/16 16:27 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/11/16 16:27 / dck
Boron	ND	mg/kg-dry		1		SW6010B	11/10/16 18:19 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/11/16 16:27 / dck
Copper	2	mg/kg-dry		1		SW6010B	11/08/16 10:42 / sld
Iron	56	mg/kg-dry		5		SW6010B	11/08/16 10:42 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/11/16 16:27 / dck
Manganese	304	mg/kg-dry		1		SW6010B	11/08/16 10:42 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/11/16 16:27 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/11/16 16:27 / dck
Zinc	11	mg/kg-dry		1		SW6010B	11/08/16 10:42 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-040
Client Sample ID: H15-N

Report Date: 11/22/16
Collection Date: 10/25/16 17:52
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/11/16 16:31 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/11/16 16:31 / dck
Boron	7	mg/kg-dry		1		SW6010B	11/08/16 10:46 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/11/16 16:31 / dck
Copper	4	mg/kg-dry		1		SW6010B	11/08/16 10:46 / sld
Iron	94	mg/kg-dry		5		SW6010B	11/08/16 10:46 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/11/16 16:31 / dck
Manganese	272	mg/kg-dry		1		SW6010B	11/08/16 10:46 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/11/16 16:31 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/11/16 16:31 / dck
Zinc	39	mg/kg-dry		1		SW6010B	11/08/16 10:46 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-041
Client Sample ID: H17-S

Report Date: 11/22/16
Collection Date: 10/26/16 10:04
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	19.0	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-045
Client Sample ID: H19-S

Report Date: 11/22/16
Collection Date: 10/26/16 10:35
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	19.5	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-047
Client Sample ID: H19-G

Report Date: 11/22/16
Collection Date: 10/26/16 10:35
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/11/16 16:34 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/11/16 16:34 / dck
Boron	1	mg/kg-dry		1		SW6010B	11/10/16 18:22 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/11/16 16:34 / dck
Copper	4	mg/kg-dry		1		SW6010B	11/08/16 10:49 / sld
Iron	66	mg/kg-dry		5		SW6010B	11/08/16 10:49 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/11/16 16:34 / dck
Manganese	157	mg/kg-dry		1		SW6010B	11/08/16 10:49 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/11/16 16:34 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/11/16 16:34 / dck
Zinc	13	mg/kg-dry		1		SW6010B	11/08/16 10:49 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-048
Client Sample ID: H19-N

Report Date: 11/22/16
Collection Date: 10/26/16 10:35
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/11/16 16:37 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/11/16 16:37 / dck
Boron	11	mg/kg-dry		1		SW6010B	11/08/16 10:53 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/11/16 16:37 / dck
Copper	3	mg/kg-dry		1		SW6010B	11/08/16 10:53 / sld
Iron	50	mg/kg-dry		5		SW6010B	11/08/16 10:53 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/11/16 16:37 / dck
Manganese	103	mg/kg-dry		1		SW6010B	11/08/16 10:53 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/11/16 16:37 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/11/16 16:37 / dck
Zinc	26	mg/kg-dry		1		SW6010B	11/08/16 10:53 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-049
Client Sample ID: H20-S

Report Date: 11/22/16
Collection Date: 10/26/16 11:00
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	19.8	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-053
Client Sample ID: H21-S

Report Date: 11/22/16
Collection Date: 10/26/16 11:30
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	18.9	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-057
Client Sample ID: H22-S

Report Date: 11/22/16
Collection Date: 10/26/16 11:55
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	15.7	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-059
Client Sample ID: H22-G

Report Date: 11/22/16
Collection Date: 10/26/16 11:35
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/11/16 16:41 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/11/16 16:41 / dck
Boron	2	mg/kg-dry		1		SW6010B	11/10/16 18:26 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/11/16 16:41 / dck
Copper	4	mg/kg-dry		1		SW6010B	11/08/16 10:57 / sld
Iron	53	mg/kg-dry		5		SW6010B	11/08/16 10:57 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/11/16 16:41 / dck
Manganese	179	mg/kg-dry		1		SW6010B	11/08/16 10:57 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/11/16 16:41 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/11/16 16:41 / dck
Zinc	25	mg/kg-dry		1		SW6010B	11/08/16 10:57 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-060
Client Sample ID: H22-N

Report Date: 11/22/16
Collection Date: 10/26/16 11:35
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/11/16 16:44 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/11/16 16:44 / dck
Boron	12	mg/kg-dry		1		SW6010B	11/08/16 11:00 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/11/16 16:44 / dck
Copper	3	mg/kg-dry		1		SW6010B	11/08/16 11:00 / sld
Iron	67	mg/kg-dry		5		SW6010B	11/08/16 11:00 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/11/16 16:44 / dck
Manganese	108	mg/kg-dry		1		SW6010B	11/08/16 11:00 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/11/16 16:44 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/11/16 16:44 / dck
Zinc	30	mg/kg-dry		1		SW6010B	11/08/16 11:00 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-061
Client Sample ID: H23-S

Report Date: 11/22/16
Collection Date: 10/26/16 14:01
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	19.7	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-065
Client Sample ID: H24-S

Report Date: 11/22/16
Collection Date: 10/26/16 13:45
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	19.9	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-069
Client Sample ID: H27-S

Report Date: 11/22/16
Collection Date: 10/26/16 15:50
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	17.2	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-073
Client Sample ID: H28-S

Report Date: 11/22/16
Collection Date: 10/26/16 16:15
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	19.7	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-075
Client Sample ID: H28-G

Report Date: 11/22/16
Collection Date: 10/26/16 16:15
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/11/16 16:57 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/11/16 16:57 / dck
Boron	1	mg/kg-dry		1		SW6010B	11/10/16 18:30 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/11/16 16:57 / dck
Copper	3	mg/kg-dry		1		SW6010B	11/08/16 11:04 / sld
Iron	57	mg/kg-dry		5		SW6010B	11/08/16 11:04 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/11/16 16:57 / dck
Manganese	180	mg/kg-dry		1		SW6010B	11/08/16 11:04 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/11/16 16:57 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/11/16 16:57 / dck
Zinc	22	mg/kg-dry		1		SW6010B	11/08/16 11:04 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-076
Client Sample ID: H28-N

Report Date: 11/22/16
Collection Date: 10/26/16 16:15
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/09/16 13:44 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/09/16 13:44 / dck
Boron	12	mg/kg-dry		1		SW6010B	11/08/16 11:41 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/09/16 13:44 / dck
Copper	5	mg/kg-dry		1		SW6010B	11/08/16 11:41 / sld
Iron	78	mg/kg-dry		5		SW6010B	11/08/16 11:41 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/09/16 13:44 / dck
Manganese	111	mg/kg-dry		1		SW6010B	11/08/16 11:41 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/09/16 13:44 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/09/16 13:44 / dck
Zinc	27	mg/kg-dry		1		SW6010B	11/08/16 11:41 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-077
Client Sample ID: H30-S

Report Date: 11/22/16
Collection Date: 10/26/16 16:40
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	17.7	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-081
Client Sample ID: H32-S

Report Date: 11/22/16
Collection Date: 10/26/16 17:48
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	19.2	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-085
Client Sample ID: H33-S

Report Date: 11/22/16
Collection Date: 10/26/16 18:05
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	16.7	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-087
Client Sample ID: H33-G

Report Date: 11/22/16
Collection Date: 10/26/16 18:05
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/09/16 13:48 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/09/16 13:48 / dck
Boron	2	mg/kg-dry		1		SW6010B	11/10/16 17:38 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/09/16 13:48 / dck
Copper	5	mg/kg-dry		1		SW6010B	11/08/16 11:44 / sld
Iron	103	mg/kg-dry		5		SW6010B	11/08/16 11:44 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/09/16 13:48 / dck
Manganese	204	mg/kg-dry		1		SW6010B	11/08/16 11:44 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/09/16 13:48 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/09/16 13:48 / dck
Zinc	14	mg/kg-dry		1		SW6010B	11/08/16 11:44 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-088
Client Sample ID: H33-N

Report Date: 11/22/16
Collection Date: 10/26/16 18:05
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/09/16 13:51 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/09/16 13:51 / dck
Boron	11	mg/kg-dry		1		SW6010B	11/08/16 11:48 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/09/16 13:51 / dck
Copper	3	mg/kg-dry		1		SW6010B	11/08/16 11:48 / sld
Iron	88	mg/kg-dry		5		SW6010B	11/08/16 11:48 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/09/16 13:51 / dck
Manganese	158	mg/kg-dry		1		SW6010B	11/08/16 11:48 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/09/16 13:51 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/09/16 13:51 / dck
Zinc	22	mg/kg-dry		1		SW6010B	11/08/16 11:48 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-089
Client Sample ID: H34-S

Report Date: 11/22/16
Collection Date: 10/26/16 18:20
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	23.9	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-091
Client Sample ID: H34-G

Report Date: 11/22/16
Collection Date: 10/26/16 18:20
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/09/16 13:54 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/09/16 13:54 / dck
Boron	2	mg/kg-dry		1		SW6010B	11/08/16 12:29 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/09/16 13:54 / dck
Copper	7	mg/kg-dry		1		SW6010B	11/08/16 12:29 / sld
Iron	139	mg/kg-dry		5		SW6010B	11/08/16 12:29 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/09/16 13:54 / dck
Manganese	277	mg/kg-dry		1		SW6010B	11/08/16 12:29 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/09/16 13:54 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/09/16 13:54 / dck
Zinc	21	mg/kg-dry		1		SW6010B	11/08/16 12:29 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-092
Client Sample ID: H34-N

Report Date: 11/22/16
Collection Date: 10/26/16 18:20
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/09/16 13:58 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/09/16 13:58 / dck
Boron	12	mg/kg-dry		1		SW6010B	11/08/16 12:33 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/09/16 13:58 / dck
Copper	3	mg/kg-dry	D	3		SW6020	11/09/16 13:58 / dck
Iron	61	mg/kg-dry		5		SW6010B	11/08/16 12:33 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/09/16 13:58 / dck
Manganese	208	mg/kg-dry		1		SW6010B	11/08/16 12:33 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/09/16 13:58 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/09/16 13:58 / dck
Zinc	29	mg/kg-dry		1		SW6010B	11/08/16 12:33 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-093
Client Sample ID: H37-S

Report Date: 11/22/16
Collection Date: 10/26/16 17:15
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	18.7	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-095
Client Sample ID: H37-G

Report Date: 11/22/16
Collection Date: 10/26/16 17:15
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/09/16 14:01 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/09/16 14:01 / dck
Boron	2	mg/kg-dry		1		SW6010B	11/08/16 12:36 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/09/16 14:01 / dck
Copper	3	mg/kg-dry	D	3		SW6020	11/09/16 14:01 / dck
Iron	90	mg/kg-dry		5		SW6010B	11/08/16 12:36 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/09/16 14:01 / dck
Manganese	242	mg/kg-dry		1		SW6010B	11/08/16 12:36 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/09/16 14:01 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/09/16 14:01 / dck
Zinc	15	mg/kg-dry		1		SW6010B	11/08/16 12:36 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-096
Client Sample ID: H37-N

Report Date: 11/22/16
Collection Date: 10/26/16 17:15
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/09/16 14:04 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/09/16 14:04 / dck
Boron	9	mg/kg-dry		1		SW6010B	11/08/16 12:40 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/09/16 14:04 / dck
Copper	3	mg/kg-dry		1		SW6010B	11/09/16 18:12 / sld
Iron	58	mg/kg-dry		5		SW6010B	11/08/16 12:40 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/09/16 14:04 / dck
Manganese	202	mg/kg-dry		1		SW6010B	11/08/16 12:40 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/09/16 14:04 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/09/16 14:04 / dck
Zinc	40	mg/kg-dry		1		SW6010B	11/08/16 12:40 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-097
Client Sample ID: H39-S

Report Date: 11/22/16
Collection Date: 10/26/16 14:50
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	19.7	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-099
Client Sample ID: H39-G

Report Date: 11/22/16
Collection Date: 10/26/16 14:50
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/09/16 14:07 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/09/16 14:07 / dck
Boron	1	mg/kg-dry		1		SW6010B	11/10/16 17:42 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/09/16 14:07 / dck
Copper	5	mg/kg-dry		1		SW6010B	11/08/16 12:44 / sld
Iron	76	mg/kg-dry		5		SW6010B	11/08/16 12:44 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/09/16 14:07 / dck
Manganese	391	mg/kg-dry		1		SW6010B	11/08/16 12:44 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/09/16 14:07 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/09/16 14:07 / dck
Zinc	18	mg/kg-dry		1		SW6010B	11/08/16 12:44 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-100
Client Sample ID: H39-N

Report Date: 11/22/16
Collection Date: 10/26/16 14:50
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/09/16 14:11 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/09/16 14:11 / dck
Boron	10	mg/kg-dry		1		SW6010B	11/08/16 12:48 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/09/16 14:11 / dck
Copper	3	mg/kg-dry		1		SW6010B	11/09/16 18:16 / sld
Iron	57	mg/kg-dry		5		SW6010B	11/08/16 12:48 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/09/16 14:11 / dck
Manganese	199	mg/kg-dry		1		SW6010B	11/08/16 12:48 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/09/16 14:11 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/09/16 14:11 / dck
Zinc	36	mg/kg-dry		1		SW6010B	11/08/16 12:48 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-101
Client Sample ID: H40-S

Report Date: 11/22/16
Collection Date: 10/26/16 14:30
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	20.7	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-105
Client Sample ID: H41-S

Report Date: 11/22/16
Collection Date: 10/26/16 15:20
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	17.1	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-109
Client Sample ID: H42-S

Report Date: 11/22/16
Collection Date: 10/26/16 13:00
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	22.4	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-111
Client Sample ID: H42-G

Report Date: 11/22/16
Collection Date: 10/26/16 13:00
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/09/16 14:14 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/09/16 14:14 / dck
Boron	2	mg/kg-dry		1		SW6010B	11/08/16 12:51 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/09/16 14:14 / dck
Copper	3	mg/kg-dry	D	3		SW6020	11/09/16 14:14 / dck
Iron	76	mg/kg-dry		5		SW6010B	11/08/16 12:51 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/09/16 14:14 / dck
Manganese	175	mg/kg-dry		1		SW6010B	11/08/16 12:51 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/09/16 14:14 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/09/16 14:14 / dck
Zinc	19	mg/kg-dry		1		SW6010B	11/08/16 12:51 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-112
Client Sample ID: H42-N

Report Date: 11/22/16
Collection Date: 10/26/16 13:00
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/09/16 14:31 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/09/16 14:31 / dck
Boron	10	mg/kg-dry		1		SW6010B	11/08/16 12:55 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/09/16 14:31 / dck
Copper	3	mg/kg-dry	D	3		SW6020	11/09/16 14:31 / dck
Iron	72	mg/kg-dry		5		SW6010B	11/08/16 12:55 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/09/16 14:31 / dck
Manganese	122	mg/kg-dry		1		SW6010B	11/08/16 12:55 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/09/16 14:31 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/09/16 14:31 / dck
Zinc	24	mg/kg-dry		1		SW6010B	11/08/16 12:55 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-113
Client Sample ID: H43-S

Report Date: 11/22/16
Collection Date: 10/26/16 12:30
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	23.5	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-117
Client Sample ID: H44-S

Report Date: 11/22/16
Collection Date: 10/25/16 17:25
DateReceived: 10/31/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	26.5	wt%		0.2		D2974	11/03/16 10:54 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-119
Client Sample ID: H44-G

Report Date: 11/22/16
Collection Date: 10/25/16 18:25
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/09/16 14:34 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/09/16 14:34 / dck
Boron	2	mg/kg-dry		1		SW6010B	11/08/16 12:59 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/09/16 14:34 / dck
Copper	2	mg/kg-dry		1		SW6010B	11/09/16 18:34 / sld
Iron	44	mg/kg-dry	D	10		SW6010B	11/08/16 12:59 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/09/16 14:34 / dck
Manganese	142	mg/kg-dry		1		SW6010B	11/08/16 12:59 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/09/16 14:34 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/09/16 14:34 / dck
Zinc	24	mg/kg-dry		1		SW6010B	11/08/16 12:59 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation
Lab ID: H16100582-120
Client Sample ID: H44-N

Report Date: 11/22/16
Collection Date: 10/25/16 18:25
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/09/16 14:37 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/09/16 14:37 / dck
Boron	9	mg/kg-dry		1		SW6010B	11/08/16 13:10 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/09/16 14:37 / dck
Copper	3	mg/kg-dry	D	3		SW6020	11/09/16 14:37 / dck
Iron	82	mg/kg-dry		5		SW6010B	11/08/16 13:10 / sld
Lead	ND	mg/kg-dry		1		SW6020	11/09/16 14:37 / dck
Manganese	159	mg/kg-dry		1		SW6010B	11/08/16 13:10 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/09/16 14:37 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/09/16 14:37 / dck
Zinc	36	mg/kg-dry		1		SW6010B	11/08/16 13:10 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Revett Silver Company
Report Date: 11/22/16
Project: Troy Mining TSF Vegetation
Work Order: H16100582

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: D2974									Batch: R120099
Lab ID: H16100582-037ADUP	Sample Duplicate				Run: SOIL DRYING OVEN 2_16110				11/03/16 10:54
Moisture (As Received)	21.5	wt%	0.20				1.0	20	
Lab ID: H16100582-077ADUP	Sample Duplicate				Run: SOIL DRYING OVEN 2_16110				11/03/16 10:54
Moisture (As Received)	17.4	wt%	0.20				1.9	20	
Lab ID: H16100582-117ADUP	Sample Duplicate				Run: SOIL DRYING OVEN 2_16110				11/03/16 10:54
Moisture (As Received)	27.7	wt%	0.20				4.2	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Revett Silver Company
Report Date: 11/22/16
Project: Troy Mining TSF Vegetation
Work Order: H16100582

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **SW6010B**								Analytical Run: ICP2-HE_161108B	
Lab ID: **ICV**	Initial Calibration Verification Standard							11/08/16 08:04	
Boron	0.796	mg/L	0.10	99	90	110			
Copper	0.805	mg/L	0.010	101	90	110			
Iron	3.94	mg/L	0.030	99	90	110			
Manganese	3.95	mg/L	0.010	99	90	110			
Zinc	0.796	mg/L	0.010	100	90	110			
Lab ID: **ICSA**	Interference Check Sample A							11/08/16 08:42	
Boron	-0.00845	mg/L	0.10		0	0			
Copper	-0.00322	mg/L	0.010		0	0			
Iron	181	mg/L	0.030	90	80	120			
Manganese	-0.0254	mg/L	0.010		0	0			
Zinc	-0.000380	mg/L	0.010		0	0			
Lab ID: **ICSAB**	Interference Check Sample AB							11/08/16 08:46	
Boron	0.918	mg/L	0.10	92	80	120			
Copper	0.481	mg/L	0.010	96	80	120			
Iron	177	mg/L	0.030	89	80	120			
Manganese	0.436	mg/L	0.010	87	80	120			
Zinc	0.954	mg/L	0.010	95	80	120			
Method: **SW6010B**								Batch: 35092	
Lab ID: **MB-35092**	Method Blank				Run: ICP2-HE_161108B			11/08/16 09:32	
Boron	ND	mg/kg	0.3						
Copper	ND	mg/kg	0.2						
Iron	3	mg/kg	1						
Manganese	0.1	mg/kg	0.05						
Zinc	ND	mg/kg	0.3						
Lab ID: **LFB-35092**	Laboratory Fortified Blank				Run: ICP2-HE_161108B			11/08/16 09:36	
Boron	47.6	mg/kg	1.0	95	80	120			
Copper	47.6	mg/kg	1.0	95	80	120			
Iron	244	mg/kg	5.0	97	80	120			
Manganese	240	mg/kg	1.0	96	80	120			
Zinc	48.6	mg/kg	1.0	97	80	120			
Lab ID: **LCS-35092**	Laboratory Control Sample				Run: ICP2-HE_161108B			11/08/16 09:47	
Boron	107	mg/kg	1.3	83	59.5	106.2			
Copper	120	mg/kg	1.0	87	76.6	108.8			
Iron	15400	mg/kg	6.7	94	51.7	131.9			
Manganese	401	mg/kg	1.0	92	81.1	116.6			
Zinc	232	mg/kg	1.7	100	75.3	111.7			
Lab ID: **H16100582-075APDS**	Post Digestion/Distillation Spike				Run: ICP2-HE_161108B			11/08/16 11:19	
Boron	48.9	mg/kg-dry	1.0	95	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Revett Silver Company
Report Date: 11/22/16
Project: Troy Mining TSF Vegetation
Work Order: H16100582

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **SW6010B**									Batch: 35092
Lab ID: **H16100582-075APDS**	Post Digestion/Distillation Spike				Run: ICP2-HE_161108B				11/08/16 11:19
Copper	51.7	mg/kg-dry	1.0	97	75	125			
Iron	294	mg/kg-dry	5.0	95	75	125			
Manganese	412	mg/kg-dry	1.0	93	75	125			
Zinc	68.5	mg/kg-dry	1.0	94	75	125			
Lab ID: **H16100582-075AMS**	Sample Matrix Spike				Run: ICP2-HE_161108B				11/08/16 11:23
Boron	48.3	mg/kg-dry	1.0	95	75	125			
Copper	51.2	mg/kg-dry	1.0	98	75	125			
Iron	297	mg/kg-dry	5.0	98	75	125			
Manganese	415	mg/kg-dry	1.0	96	75	125			
Zinc	68.7	mg/kg-dry	1.0	97	75	125			
Lab ID: **H16100582-075AMSD**	Sample Matrix Spike Duplicate				Run: ICP2-HE_161108B				11/08/16 11:26
Boron	48.0	mg/kg-dry	1.0	95	75	125	0.4	20	
Copper	50.9	mg/kg-dry	1.0	98	75	125	0.5	20	
Iron	310	mg/kg-dry	5.0	104	75	125	4.2	20	
Manganese	421	mg/kg-dry	1.0	100	75	125	1.5	20	
Zinc	69.4	mg/kg-dry	1.0	99	75	125	0.9	20	
Method: **SW6010B**									Batch: 35093
Lab ID: **LFB-35093**	Laboratory Fortified Blank				Run: ICP2-HE_161108B				11/08/16 11:33
Boron	48.0	mg/kg	1.0	97	80	120			
Copper	48.8	mg/kg	1.0	98	80	120			
Iron	246	mg/kg	5.0	97	80	120			
Manganese	242	mg/kg	1.0	98	80	120			
Zinc	49.0	mg/kg	1.0	99	80	120			
Lab ID: **LCS-35093**	Laboratory Control Sample				Run: ICP2-HE_161108B				11/08/16 11:37
Boron	105	mg/kg	1.3	82	59.5	106.2			
Copper	118	mg/kg	1.0	86	76.6	108.8			
Iron	15000	mg/kg	6.6	92	51.7	131.9			
Manganese	396	mg/kg	1.0	91	81.1	116.6			
Zinc	226	mg/kg	1.7	98	75.3	111.7			
Lab ID: **H16100582-120APDS**	Post Digestion/Distillation Spike				Run: ICP2-HE_161108B				11/08/16 13:17
Boron	59.8	mg/kg-dry	1.0	99	75	125			
Copper	55.1	mg/kg-dry	1.0	100	75	125			
Iron	331	mg/kg-dry	5.0	97	75	125			
Manganese	409	mg/kg-dry	1.0	97	75	125			
Zinc	85.6	mg/kg-dry	1.0	97	75	125			
Lab ID: **H16100582-120AMS**	Sample Matrix Spike				Run: ICP2-HE_161108B				11/08/16 13:21
Boron	57.5	mg/kg-dry	1.0	98	75	125			
Copper	54.2	mg/kg-dry	1.0	101	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Revett Silver Company
Report Date: 11/22/16
Project: Troy Mining TSF Vegetation
Work Order: H16100582

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **SW6010B**									Batch: 35093
Lab ID: **H16100582-120AMS**	Sample Matrix Spike				Run: ICP2-HE_161108B				11/08/16 13:21
Iron	331	mg/kg-dry	5.0	100	75	125			
Manganese	405	mg/kg-dry	1.0	99	75	125			
Zinc	84.7	mg/kg-dry	1.0	98	75	125			
Lab ID: **H16100582-120AMSD**	Sample Matrix Spike Duplicate				Run: ICP2-HE_161108B				11/08/16 13:24
Boron	55.3	mg/kg-dry	1.0	93	75	125	3.9	20	
Copper	51.9	mg/kg-dry	1.0	96	75	125	4.4	20	
Iron	314	mg/kg-dry	5.0	93	75	125	5.4	20	
Manganese	391	mg/kg-dry	1.0	93	75	125	3.5	20	
Zinc	80.9	mg/kg-dry	1.0	90	75	125	4.6	20	
Method: **SW6010B**									Analytical Run: ICP2-HE_161109C
Lab ID: **ICV**	Initial Calibration Verification Standard								11/09/16 13:17
Copper	0.795	mg/L	0.010	99	90	110			
Lab ID: **ICSA**	Interference Check Sample A								11/09/16 13:55
Copper	0.00252	mg/L	0.010		0	0			
Lab ID: **ICSAB**	Interference Check Sample AB								11/09/16 13:59
Copper	0.506	mg/L	0.010	101	80	120			
Method: **SW6010B**									Batch: 35093
Lab ID: **MB-35093**	Method Blank				Run: ICP2-HE_161109C				11/09/16 17:57
Boron	ND	mg/kg	0.3						
Copper	ND	mg/kg	0.2						
Iron	5	mg/kg	1						
Manganese	ND	mg/kg	0.05						
Zinc	ND	mg/kg	0.3						
Method: **SW6010B**									Analytical Run: ICP2-HE_161110B
Lab ID: **ICV**	Initial Calibration Verification Standard								11/10/16 11:38
Boron	0.770	mg/L	0.10	96	90	110			
Lab ID: **ICSA**	Interference Check Sample A								11/10/16 12:16
Boron	-0.0122	mg/L	0.10		0	0			
Lab ID: **ICSAB**	Interference Check Sample AB								11/10/16 12:20
Boron	0.973	mg/L	0.10	97	80	120			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Revett Silver Company
Report Date: 11/22/16
Project: Troy Mining TSF Vegetation
Work Order: H16100582

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **SW6020**								Analytical Run: ICPMS204-B_161109B	
Lab ID: **ICV STD**	Initial Calibration Verification Standard							11/09/16 09:53	
Antimony	0.0593	mg/L	0.0010	99	90	110			
Arsenic	0.0601	mg/L	0.0010	100	90	110			
Cadmium	0.0297	mg/L	0.0010	99	90	110			
Copper	0.0601	mg/L	0.0010	100	90	110			
Lead	0.0570	mg/L	0.0010	95	90	110			
Selenium	0.0588	mg/L	0.0010	98	90	110			
Silver	0.0290	mg/L	0.0010	97	90	110			
Method: **SW6020**								Batch: 35093	
Lab ID: **MB-35093**	Method Blank				Run: ICPMS204-B_161109B			11/09/16 13:34	
Antimony	ND	mg/kg	0.4						
Arsenic	ND	mg/kg	0.2						
Cadmium	ND	mg/kg	0.8						
Copper	ND	mg/kg	3						
Lead	ND	mg/kg	0.5						
Selenium	ND	mg/kg	0.7						
Silver	ND	mg/kg	0.3						
Lab ID: **LCS-35093**	Laboratory Control Sample				Run: ICPMS204-B_161109B			11/09/16 13:38	
Antimony	64.0	mg/kg	1.0	27	0	92.9			
Arsenic	178	mg/kg	1.0	91	71.4	105.1			
Cadmium	97.8	mg/kg	1.0	99	73.9	106.1			
Copper	126	mg/kg	3.0	92	76.6	108.8			
Lead	100	mg/kg	1.0	95	74.4	108.6			
Selenium	209	mg/kg	1.0	102	71.2	110.2			
Silver	38.8	mg/kg	1.0	92	70.8	111.9			
Lab ID: **LFB-35093**	Laboratory Fortified Blank				Run: ICPMS204-B_161109B			11/09/16 13:41	
Antimony	51.2	mg/kg	1.0	103	80	120			
Arsenic	52.5	mg/kg	1.0	106	80	120			
Cadmium	26.2	mg/kg	1.0	106	80	120			
Copper	49.3	mg/kg	3.0	99	80	120			
Lead	47.9	mg/kg	1.0	97	80	120			
Selenium	54.1	mg/kg	1.0	109	80	120			
Silver	24.5	mg/kg	1.0	99	80	120			
Lab ID: **H16100582-120APDS**	Post Digestion/Distillation Spike				Run: ICPMS204-B_161109B			11/09/16 14:44	
Antimony	2470	mg/kg-dry	1.0	99	75	125			
Arsenic	2510	mg/kg-dry	1.0	101	75	125			
Cadmium	1150	mg/kg-dry	1.0	92	75	125			
Copper	2300	mg/kg-dry	3.0	92	75	125			
Lead	2410	mg/kg-dry	1.0	97	75	125			
Selenium	2410	mg/kg-dry	1.0	97	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Revett Silver Company
Report Date: 11/22/16
Project: Troy Mining TSF Vegetation
Work Order: H16100582

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **SW6020**									Batch: 35093
Lab ID: **H16100582-120APDS**	Post Digestion/Distillation Spike				Run: ICPMS204-B_161109B				11/09/16 14:44
Silver	108	mg/kg-dry	1.0	9	75	125			S
Lab ID: **H16100582-120AMS**	Sample Matrix Spike				Run: ICPMS204-B_161109B				11/09/16 14:47
Antimony	52.2	mg/kg-dry	1.0	105	75	125			
Arsenic	50.9	mg/kg-dry	1.0	103	75	125			
Cadmium	25.4	mg/kg-dry	1.0	102	75	125			
Copper	55.2	mg/kg-dry	3.0	104	75	125			
Lead	48.1	mg/kg-dry	1.0	97	75	125			
Selenium	55.0	mg/kg-dry	1.0	111	75	125			
Silver	24.5	mg/kg-dry	1.0	99	75	125			
Lab ID: **H16100582-120AMSD**	Sample Matrix Spike Duplicate				Run: ICPMS204-B_161109B				11/09/16 14:51
Antimony	45.4	mg/kg-dry	1.0	91	75	125	14	20	
Arsenic	47.0	mg/kg-dry	1.0	94	75	125	8.0	20	
Cadmium	23.2	mg/kg-dry	1.0	93	75	125	8.8	20	
Copper	50.7	mg/kg-dry	3.0	94	75	125	8.5	20	
Lead	44.3	mg/kg-dry	1.0	89	75	125	8.2	20	
Selenium	46.3	mg/kg-dry	1.0	93	75	125	17	20	
Silver	21.9	mg/kg-dry	1.0	88	75	125	11	20	

Qualifiers:

RL - Analyte reporting limit.
ND - Not detected at the reporting limit.
S - Spike recovery outside of advisory limits.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mining TSF Vegetation

Report Date: 11/22/16
Work Order: H16100582

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6020								Analytical Run: ICPMS204-B_161111C	
Lab ID: ICV STD	Initial Calibration Verification Standard							11/11/16 13:47	
Antimony	0.0576	mg/L	0.0010	96	90	110			
Arsenic	0.0581	mg/L	0.0010	97	90	110			
Cadmium	0.0297	mg/L	0.0010	99	90	110			
Lead	0.0570	mg/L	0.0010	95	90	110			
Selenium	0.0596	mg/L	0.0010	99	90	110			
Silver	0.0289	mg/L	0.0010	96	90	110			
Method: SW6020								Batch: 35092	
Lab ID: MB-35092	Method Blank				Run: ICPMS204-B_161111C			11/11/16 15:24	
Antimony	ND	mg/kg	0.4						
Arsenic	ND	mg/kg	0.2						
Cadmium	ND	mg/kg	0.8						
Lead	ND	mg/kg	0.5						
Selenium	ND	mg/kg	0.7						
Silver	ND	mg/kg	0.3						
Lab ID: LCS-35092	Laboratory Control Sample				Run: ICPMS204-B_161111C			11/11/16 15:28	
Antimony	57.9	mg/kg	1.0	24	0	92.9			
Arsenic	169	mg/kg	1.0	86	71.4	105.1			
Cadmium	94.2	mg/kg	1.0	95	73.9	106.1			
Lead	102	mg/kg	1.0	97	74.4	108.6			
Selenium	198	mg/kg	1.0	97	71.2	110.2			
Silver	38.4	mg/kg	1.0	91	70.8	111.9			
Lab ID: LFB-35092	Laboratory Fortified Blank				Run: ICPMS204-B_161111C			11/11/16 15:31	
Antimony	52.8	mg/kg	1.0	105	80	120			
Arsenic	50.0	mg/kg	1.0	100	80	120			
Cadmium	25.6	mg/kg	1.0	103	80	120			
Lead	49.1	mg/kg	1.0	98	80	120			
Selenium	51.7	mg/kg	1.0	103	80	120			
Silver	26.2	mg/kg	1.0	105	80	120			
Lab ID: H16100582-075APDS	Post Digestion/Distillation Spike				Run: ICPMS204-B_161111C			11/11/16 17:04	
Antimony	2360	mg/kg-dry	1.0	98	75	125			
Arsenic	2310	mg/kg-dry	1.0	95	75	125			
Cadmium	1110	mg/kg-dry	1.0	91	75	125			
Lead	2320	mg/kg-dry	1.0	96	75	125			
Selenium	2240	mg/kg-dry	1.0	93	75	125			
Silver	1060	mg/kg-dry	1.0	88	75	125			
Lab ID: H16100582-075AMS	Sample Matrix Spike				Run: ICPMS204-B_161111C			11/11/16 17:07	
Antimony	50.3	mg/kg-dry	1.0	103	75	125			
Arsenic	48.8	mg/kg-dry	1.0	100	75	125			
Cadmium	24.8	mg/kg-dry	1.0	102	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Revett Silver Company
Report Date: 11/22/16
Project: Troy Mining TSF Vegetation
Work Order: H16100582

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **SW6020**									Batch: 35092
Lab ID: **H16100582-075AMS**	Sample Matrix Spike				Run: ICPMS204-B_161111C				11/11/16 17:07
Lead	47.6	mg/kg-dry	1.0	98	75	125			
Selenium	51.8	mg/kg-dry	1.0	106	75	125			
Silver	30.2	mg/kg-dry	1.0	124	75	125			
Lab ID: **H16100582-075AMSD**	Sample Matrix Spike Duplicate				Run: ICPMS204-B_161111C				11/11/16 17:11
Antimony	47.0	mg/kg-dry	1.0	97	75	125	6.7	20	
Arsenic	50.6	mg/kg-dry	1.0	104	75	125	3.6	20	
Cadmium	24.3	mg/kg-dry	1.0	100	75	125	2.0	20	
Lead	47.3	mg/kg-dry	1.0	98	75	125	0.5	20	
Selenium	49.4	mg/kg-dry	1.0	102	75	125	4.7	20	
Silver	27.1	mg/kg-dry	1.0	112	75	125	11	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

Work Order Receipt Checklist

Revett Silver Company

H16100582

Login completed by: Wanda Johnson
Date Received: 10/31/2016

Reviewed by: BL2000\wjohnson
Received by: bjs

Reviewed Date: 11/3/2016
Carrier name: FedEx Express

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☐	No ☑	Not Applicable ☐
Container/Temp Blank temperature:	19.3°C No Ice		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	Not Applicable ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Contact and Corrective Action Comments:

Sample containers do not include dates or times except for sample H19 which includes the collection date only. wj 10/31/16 Sample ID's on coc for samples 001-016 have "0" as part of the ID's however the e-mail with the table of samples do not. Per K. Beaudoin the COC is correct. wj 11/2/16

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Chain of Custody & Analytical Request Record

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Account Information (Billing information)

Company/Name	Revett
Contact	Skip Leedy
Phone	(406) 295-5882
Mailing Address	PO Box 1660
City, State, Zip	Troy, MT, 59935
Email	sleedy@hecla-mining.com
Receive Invoice	☐Hard Copy ☒Email
Receive Report	☐Hard Copy ☒Email
Purchase Order	
Quote	
Bottle Order	

Report Information (If different than Account Information)

Company/Name	
Contact	
Phone	
Mailing Address	
City, State, Zip	
Email	
Receive Report	☐Hard Copy ☐Email
Special Report/Formats:	☐ LEVEL IV ☐ NELAC ☐ EDD/EDT (contact laboratory) ☐ Other ______

Comments

Project Information

Project Name, PWSID, Permit, etc.	Troy Mining TSF Vegetation
Sampler Name	Kara Beaudoin
Sampler Phone	(406) 291-7467
Sample Origin State	Montana
EPA/State Compliance	☐ Yes ☐ No

MINING CLIENTS, please indicate sample type.
*If ore has been processed or refined, call before sending.
☐ Byproduct 11 (e)2 material ☐ Unprocessed ore (NOT ground or refined)*

Matrix Codes
A - Air
W - Water
S - Soils/Solids
V - Vegetation
B - Bioassay
O - Other
DW - Drinking Water

All turnaround times are standard unless marked as RUSH.
Energy Laboratories MUST be contacted prior to RUSH sample submittal for charges and scheduling – See Instructions Page

Analysis Requested

Sample Identification (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers	Matrix (See Codes Above)	Total Metals									See Attached	RUSH TAT	ELI LAB ID Laboratory Use Only
1 H02-S	10/25/16	1:40 pm	1	S	✔											H1610058 2-001
2 H02-T	10/25/16	1:40 pm	1	S	✔											002
3 H02-G	10/25/16	1:40 pm	1	V	✔											003
4 H02-N	10/25/16	1:40 pm	1	V	✔											004
5 H05-S	10/25/16	2:05 pm	1	S	✔											005
6 H05-T	10/25/16	2:05 pm	1	S	✔											006
7 H05-G	10/25/16	2:05 pm	1	V	✔											007
8 H05-N	10/25/16	2:05 pm	1	V	✔											008
9 H07-S	10/25/16	2:36 pm	1	S	✔											009
10 H07-T	10/25/16	2:36 pm	1	S	✔											010

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	KARA BEAUDOIN	10/28/16 11:45am	[signature]			
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print) B. Sober	10/31/16 9:19	[signature]

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals	Intact	Receipt Temp	Temp Blank	On Ice	Payment Type	Amount	Receipt Number (cash/check only)
Fed ExE	Y	(Y) N C B	(Y) N	19.3 °C	Y (N)	Y (N)	CC Cash Check ______	$	

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ENERGY LAB
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www.energylab.com

Account Information *(Billing information)*

Company/Name	Revett
Contact	Skip Leedy
Phone	(406) 295-5882
Mailing Address	PO Box 1660
City, State, Zip	Troy, MT, 59935
Email	sleedy@hecla-mining.com
Receive Invoice	☐Hard Copy ☒Email
Receive Report	☐Hard Copy ☒Email
Purchase Order	
Quote	
Bottle Order	

Report Information *(if different than Account Information)*

Company/Name	
Contact	
Phone	
Mailing Address	
City, State, Zip	
Email	
Receive Report	☐Hard Copy ☐Email

Special Report/Formats:
☐ LEVEL IV ☐ NELAC ☐ EDD/EDT *(contact laboratory)* ☐ Other_____

Comments

Project Information

Project Name, PWSID, Permit, etc.	Troy Mining TSF Vegetation
Sampler Name	Kara Beaudoin
Sampler Phone	(406) 291-7467
Sample Origin State	Montana
EPA/State Compliance	☐ Yes ☐ No

MINING CLIENTS, please indicate sample type.
*If ore has been processed or refined, call before sending.
☐ Byproduct 11 (e)2 material ☐ Unprocessed ore (NOT ground or refined)*

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DW - Drinking Water

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	Sample Identification *(Name, Location, Interval, etc.)*	Collection Date	Collection Time	Number of Containers	Matrix *(See Codes Above)*	Total Metals									See Attached	RUSH TAT	ELI LAB ID *Laboratory Use Only*
1	H07-G	10/25/16	2:36 pm	1	V	✓											L16100582-011
2	H07-N	10/25/16	2:36 pm	1	V	✓											-012
3	H09-S	10/25/16	3:08 pm	1	S	✓											-013
4	H09-T	10/25/16	3:08 pm	1	S	✓											-014
5	H09-G	10/25/16	3:08 pm	1	V	✓											015
6	H09-N	10/25/16	3:08 pm	1	V	✓											016
7	H10-S	10/25/16	3:38 pm	1	S	✓											017
8	H10-T	10/25/16	3:38 pm	1	S	✓											018
9	H10-G	10/25/16	3:38 pm	1	V	✓											019
10	H10-N	10/25/16	3:38 pm	1	V	✓											020

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	KARA BEAUDOIN	10/28/16 11:45AM				
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print)	Date/Time	Signature
				B Scher	10/31/16 9:19	Brandy Scher

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals	Intact	Receipt Temp	Temp Blank	On Ice	Payment Type	Amount	Receipt Number *(cash/check only)*
FedEx	Y	(Y) N C B	(Y) N	19.3 °C	(Y) N	(Y) N	CC Cash Check_____	$	

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City, State, Zip	Troy, MT, 59935
Email	sleedy@hecla-mining.com
Receive Invoice	☐Hard Copy ☒Email
Receive Report	☐Hard Copy ☒Email
Purchase Order	
Quote	
Bottle Order	

Report Information (if different than Account Information)

Company/Name	
Contact	
Phone	
Mailing Address	
City, State, Zip	
Email	
Receive Report	☐Hard Copy ☐Email

Special Report/Formats:
☐ LEVEL IV ☐ NELAC ☐ EDD/EDT (contact laboratory) ☐ Other _____

Comments

Project Information

Project Name, PWSID, Permit, etc.	Troy Mining TSF Vegetation
Sampler Name	Kara Beaudoin
Sampler Phone	(406) 291-7467
Sample Origin State	Montana
EPA/State Compliance	☐ Yes ☐ No

MINING CLIENTS, please indicate sample type.
*If ore has been processed or refined, call before sending.
☐ Byproduct 11 (e)2 material ☐ Unprocessed ore (NOT ground or refined)*

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DW - Drinking Water

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Sample Identification (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers	Matrix (See Codes Above)	Total Metals	See Attached	RUSH TAT	ELI LAB ID (Laboratory Use Only)
1 H11-S	10/25/16	4:00 pm	1	S	✔			L1610058 2-021
2 H11-T	10/25/16	4:00 pm	1	S	✔			022
3 H11-G	10/25/16	4:00 pm	1	V	✔			023
4 H11-N	10/25/16	4:00 pm	1	V	✔			024
5 H12-S	10/25/16	4:35 pm	1	S	✔			025
6 H12-T	10/25/16	4:35 pm	1	S	✔			026
7 H12-G	10/25/16	4:35 pm	1	V	✔			027
8 H12-N	10/25/16	4:35 pm	1	V	✔			028
9 H13-S	10/25/16	5:00 pm	1	S	✔			029
10 H13-T	10/25/16	5:00 pm	1	S	✔			030

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	KARA BEAUDOIN	10/28/16 11:45am				
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print)	Date/Time	Signature
					10/31/16 9:19	

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals	Intact	Receipt Temp	Temp Blank	On Ice	Payment Type	Amount	Receipt Number (cash/check only)
FedEx E	Y	Y N C B	Y N	19.3 °C	Y N	Y N	CC Cash Check_____	$	

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Email	sleedy@hecla-mining.com
Receive Invoice	☐Hard Copy ☒Email
Receive Report	☐Hard Copy ☒Email
Purchase Order	
Quote	
Bottle Order	

Report Information (if different than Account Information)

Company/Name	
Contact	
Phone	
Mailing Address	
City, State, Zip	
Email	
Receive Report	☐Hard Copy ☐Email

Special Report/Formats:
☐ LEVEL IV ☐ NELAC ☐ EDD/EDT (contact laboratory) ☐ Other _____

Comments

Project Information

Project Name, PWSID, Permit, etc.	Troy Mining TSF Vegetation
Sampler Name	Kara Beaudoin
Sampler Phone	(406) 291-7467
Sample Origin State	Montana
EPA/State Compliance	☐ Yes ☐ No

MINING CLIENTS, please indicate sample type.
*If ore has been processed or refined, call before sending.
☐ Byproduct 11 (e)2 material ☐ Unprocessed ore (NOT ground or refined)*

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	Sample Identification (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers	Matrix (See Codes Above)	Total Metals	Sea Attached	RUSH TAT	ELI LAB ID (Laboratory Use Only)
1	H13-G	10/25/16	5:00 pm	1	V	✓			H16100582-031
2	H13-N	10/25/16	5:00 pm	1	V	✓			-032
3	H14-S	10/25/16	5:30 pm	1	S	✓			033
4	H14-T	10/25/16	5:30 pm	1	S	✓			034
5	H14-G	10/25/16	5:30 pm	1	V	✓			035
6	H14-N	10/25/16	5:30 pm	1	V	✓			036
7	H15-S	10/25/16	5:52 pm	1	S	✓			037
8	H15-T	10/25/16	5:52 pm	1	S	✓			038
9	H15-G	10/25/16	5:52 pm	1	V	✓			039
10	H15-N	10/25/16	5:52 pm	1	V	✓			040

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	KARA BEAUDOIN	10/28/16 11:45AM				
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print)	Date/Time	Signature
				B. Seber	10/31/16 9:19	Beaudoin

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals	Intact	Receipt Temp	Temp Blank	On Ice	Payment Type	Amount	Receipt Number (cash/check only)
FedEx	Y	(Y) N C B	(Y) N	19.3 °C	Y (N)	Y (N)	CC Cash Check_____	$	

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Account Information *(Billing information)*

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Contact	Skip Leedy
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City, State, Zip	Troy, MT, 59935
Email	sleedy@hecla-mining.com
Receive Invoice	☐Hard Copy ☒Email
Receive Report	☐Hard Copy ☒Email
Purchase Order	
Quote	
Bottle Order	

Report Information *(if different than Account Information)*

Company/Name	
Contact	
Phone	
Mailing Address	
City, State, Zip	
Email	
Receive Report	☐Hard Copy ☐Email

Special Report/Formats:
☐ LEVEL IV ☐ NELAC ☐ EDD/EDT *(contact laboratory)* ☐ Other _____

Comments

Project Information

Project Name, PWSID, Permit, etc.	Troy Mining TSF Vegetation
Sampler Name	Kara Beaudoin
Sampler Phone	(406) 291-7467
Sample Origin State	Montana
EPA/State Compliance	☐ Yes ☐ No

MINING CLIENTS, please indicate sample type.
*If ore has been processed or refined, call before sending.
☐ Byproduct 11 (e)2 material ☐ Unprocessed ore (NOT ground or refined)*

Matrix Codes
A - Air
W - Water
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V - Vegetation
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O - Other
DW - Drinking Water

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	Sample Identification *(Name, Location, Interval, etc.)*	Collection Date	Collection Time	Number of Containers	Matrix *(See Codes Above)*	Total Metals									See Attached	RUSH TAT	ELI LAB ID *Laboratory Use Only*
1	H17-S	10/26/16	10:04 am	1	S	✓											H16100582-041
2	H17-T	10/26/16	10:04 am	1	S	✓											042
3	H17-G	10/26/16	10:04 am	1	V	✓											043
4	H17-N	10/26/16	10:04 am	1	V	✓											044
5	H19-S	10/26/16	10:35 am	1	S	✓											045
6	H19-T	10/26/16	10:35 am	1	S	✓											046
7	H19-G	10/26/16	10:35 am	1	V	✓											047
8	H19-N	10/26/16	10:35 am	1	V	✓											048
9	H20-S	10/26/16	11:00 am	1	S	✓											049
10	H20-T	10/26/16	11:00 am	1	S	✓											050

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	KARA BEAUDOIN	10/28/16 11:45 AM				
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print)	Date/Time	Signature
					10/31/16 9:19	

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals	Intact	Receipt Temp	Temp Blank	On Ice	Payment Type	Amount	Receipt Number *(cash/check only)*
FedEx	Y	Y N C B	Y N	19.3 °C	Y N	Y N	CC Cash Check_____	$	

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Receive Invoice	☐Hard Copy ☒Email
Receive Report	☐Hard Copy ☒Email
Purchase Order	
Quote	
Bottle Order	

Report Information (if different than Account Information)

Company/Name	
Contact	
Phone	
Mailing Address	
City, State, Zip	
Email	
Receive Report	☐Hard Copy ☐Email

Special Report/Formats:
☐ LEVEL IV ☐ NELAC ☐ EDD/EDT (contact laboratory) ☐ Other_____

Comments

Project Information

Project Name, PWSID, Permit, etc.	Troy Mining TSF Vegetation
Sampler Name	Kara Beaudoin
Sampler Phone	(406) 291-7467
Sample Origin State	Montana
EPA/State Compliance	☐ Yes ☐ No

MINING CLIENTS, please indicate sample type.
*If ore has been processed or refined, call before sending.
☐ Byproduct 11 (e)2 material ☐ Unprocessed ore (NOT ground or refined)*

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A - Air
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	Sample Identification (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers	Matrix (See Codes Above)	Total Metals									See Attached	RUSH TAT	ELI LAB ID (Laboratory Use Only)
1	H20-G	10/26/16	11:00 am	1	V	✓											H16100582-051
2	H20-N	10/26/16	11:00 am	1	V	✓											052
3	H21-S	10/26/16	11:30 am	1	S	✓											053
4	H21-T	10/26/16	11:30 am	1	S	✓											054
5	H21-G	10/26/16	11:30 am	1	V	✓											055
6	H21-N	10/26/16	11:30 am	1	V	✓											056
7	H22-S	10/26/16	11:55 am	1	S	✓											057
8	H22-T	10/26/16	11:55 am	1	S	✓											058
9	H22-G	10/26/16	11:55 am	1	V	✓											059
10	H22-N	10/26/16	11:55 am	1	V	✓											060

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	KARA BEAUDOIN	10/28/16 11:45am				
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print)	Date/Time	Signature
				B. Seker	10/31/16 9:19	

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals	Intact	Receipt Temp	Temp Blank	On Ice	Payment Type	Amount	Receipt Number (cash/check only)
FedEx	4	Y N C B	Y N	19.3 °C	Y N	Y N	CC Cash Check_____	$	

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Receive Invoice	☐Hard Copy ☒Email
Receive Report	☐Hard Copy ☒Email
Purchase Order	
Quote	
Bottle Order	

Report Information *(if different than Account Information)*

Company/Name	
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Mailing Address	
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Special Report/Formats:
☐ LEVEL IV ☐ NELAC ☐ EDD/EDT *(contact laboratory)* ☐ Other_____

Comments

Project Information

Project Name, PWSID, Permit, etc.	Troy Mining TSF Vegetation
Sampler Name	Kara Beaudoin
Sampler Phone	(406) 291-7467
Sample Origin State	Montana
EPA/State Compliance	☐ Yes ☐ No

MINING CLIENTS, please indicate sample type.
*If ore has been processed or refined, call before sending.
☐ Byproduct 11 (e)2 material ☐ Unprocessed ore (NOT ground or refined)*

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1	H23-S	10/26/16	2:01 pm	1	S	✔											H16100582-061
2	H23-T	10/26/16	2:01 pm	1	S	✔											062
3	H23-G	10/26/16	2:01 pm	1	V	✔											063
4	H23-N	10/26/16	2:01 pm	1	V	✔											064
5	H24-S	10/26/16	1:45 pm	1	S	✔											065
6	H24-T	10/26/16	1:45 pm	1	S	✔											066
7	H24-G	10/26/16	1:45 pm	1	V	✔											067
8	H24-N	10/26/16	1:45 pm	1	V	✔											068
9	H27-S	10/26/16	3:50 pm	1	S	✔											069
10	H27-T	10/26/16	3:50 pm	1	S	✔											070

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	KARA BEAUDOIN	10/28/16 11:45AM				
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print)	Date/Time	Signature
				B. Seiler	10/31/16 9:19	Brandy Shaw

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals	Intact	Receipt Temp	Temp Blank	On-Ice	Payment Type	Amount	Receipt Number *(cash/check only)*
FedEx	Y	(Y) N C B	(Y) N	19.3 °C	(Y) N	(Y) N	CC Cash Check_____	$	

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Chain of Custody & Analytical Request Record

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Account Information (Billing information)

Company/Name	Revett
Contact	Skip Leedy
Phone	(406) 295-5882
Mailing Address	PO Box 1660
City, State, Zip	Troy, MT, 59935
Email	sleedy@hecla-mining.com
Receive Invoice	☐Hard Copy ☒Email
Receive Report	☐Hard Copy ☒Email
Purchase Order	
Quote	
Bottle Order	

Report Information (if different than Account Information)

Company/Name	
Contact	
Phone	
Mailing Address	
City, State, Zip	
Email	
Receive Report	☐Hard Copy ☐Email

Special Report/Formats:
☐ LEVEL IV ☐ NELAC ☐ EDD/EDT (contact laboratory) ☐ Other

Comments

Project Information

Project Name, PWSID, Permit, etc.	Troy Mining TSF Vegetation
Sampler Name	Kara Beaudoin
Sampler Phone	(406) 291-7467
Sample Origin State	Montana
EPA/State Compliance	☐ Yes ☐ No

MINING CLIENTS, please indicate sample type.
*If ore has been processed or refined, call before sending.
☐ Byproduct 11 (e)2 material ☐ Unprocessed ore (NOT ground or refined)*

Matrix Codes
A - Air
W - Water
S - Soils/Solids
V - Vegetation
B - Bioassay
O - Other
DW - Drinking Water

All turnaround times are standard unless marked as RUSH.
Energy Laboratories MUST be contacted prior to RUSH sample submittal for charges and scheduling – See Instructions Page

	Sample Identification (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers	Matrix (See Codes Above)	Total Metals	See Attached	RUSH TAT	ELI LAB ID (Laboratory Use Only)
1	H27-G	10/26/16	3:50 pm	1	V	✔			1161005 82-071
2	H27-N	10/26/16	3:50 pm	1	V	✔			072
3	H28-S	10/26/16	4:15 pm	1	S	✔			073
4	H28-T	10/26/16	4:15 pm	1	S	✔			074
5	H28-G	10/26/16	4:15 pm	1	V	✔			075
6	H28-N	10/26/16	4:15 pm	1	V	✔			076
7	H30-S	10/26/16	4:40 pm	1	S	✔			077
8	H30-T	10/26/16	4:40 pm	1	S	✔			078
9	H30-G	10/26/16	4:40 pm	1	V	✔			079
10	H30-N	10/26/16	4:40 pm	1	V	✔			080

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	KARA BEAUDOIN	10/28/16 11:45AM				
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print)	Date/Time	Signature
					10/31/16 9:19	

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals	Intact	Receipt Temp	Temp Blank	On Ice	Payment Type	Amount	Receipt Number (cash/check only)
FedEx	Y	(Y) N C B	(Y) N	19.3 °C	Y (N)	Y (N)	CC Cash Check	$	

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Account Information (Billing information)

Company/Name	Revett
Contact	Skip Leedy
Phone	(406) 295-5882
Mailing Address	PO Box 1660
City, State, Zip	Troy, MT, 59935
Email	sleedy@hecla-mining.com
Receive Invoice ☐Hard Copy ☒Email	Receive Report ☐Hard Copy ☒Email
Purchase Order	Quote / Bottle Order

Report Information (if different than Account Information)

Company/Name	
Contact	
Phone	
Mailing Address	
City, State, Zip	
Email	
Receive Report ☐Hard Copy ☐Email	
Special Report/Formats: ☐ LEVEL IV ☐ NELAC ☐ EDD/EDT (contact laboratory) ☐ Other	

Comments

Project Information

Project Name, PWSID, Permit, etc.	Troy Mining TSF Vegetation
Sampler Name Kara Beaudoin	Sampler Phone (406) 291-7467
Sample Origin State Montana	EPA/State Compliance ☐ Yes ☐ No

MINING CLIENTS, please indicate sample type.
*If ore has been processed or refined, call before sending.
☐ Byproduct 11 (e)2 material ☐ Unprocessed ore (NOT ground or refined)*

Matrix Codes
A - Air
W - Water
S - Soils/Solids
V - Vegetation
B - Bioassay
O - Other
DW - Drinking Water

All turnaround times are standard unless marked as RUSH.
Energy Laboratories MUST be contacted prior to RUSH sample submittal for charges and scheduling – See Instructions Page

Sample Identification (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers	Matrix (See Codes Above)	Total Metals									See Attached	RUSH TAT	ELI LAB ID Laboratory Use Only
1 H32-S	10/26/16	5:48 pm	1	S	✔											H16100582-081
2 H32-T	10/26/16	5:48 pm	1	S	✔											082
3 H32-G	10/26/16	5:48 pm	1	V	✔											083
4 H32-N	10/26/16	5:48 pm	1	V	✔											084
5 H33-S	10/26/16	6:05 pm	1	S	✔											085
6 H33-T	10/26/16	6:05 pm	1	S	✔											086
7 H33-G	10/26/16	6:05 pm	1	V	✔											087
8 H33-N	10/26/16	6:05 pm	1	V	✔											088
9 H34-S	10/26/16	6:20 pm	1	S	✔											089
10 H34-T	10/26/16	6:20 pm	1	S	✔											090

(Analysis Requested)

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	KARA BEAUDOIN	10/28/16 11:45AM	[signature]			
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print) B. Seher	10/31/16 09:19	[signature]

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals	Intact	Receipt Temp	Temp Blank	On Ice	Payment Type	Amount	Receipt Number (cash/check only)
FedEx	Y	(Y) N C B	(Y) N	19.3 °C	Y (N)	Y (N)	CC Cash Check____	$	

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Account Information (Billing information)

Company/Name	Revett
Contact	Skip Leedy
Phone	(406) 295-5882
Mailing Address	PO Box 1660
City, State, Zip	Troy, MT, 59935
Email	sleedy@hecla-mining.com
Receive Invoice	☐Hard Copy ☒Email
Receive Report	☐Hard Copy ☒Email
Purchase Order	
Quote	
Bottle Order	

Report Information (if different than Account Information)

Company/Name	
Contact	
Phone	
Mailing Address	
City, State, Zip	
Email	
Receive Report	☐Hard Copy ☐Email

Special Report/Formats:
☐ LEVEL IV ☐ NELAC ☐ EDD/EDT (contact laboratory) ☐ Other

Comments

Project Information

Project Name, PWSID, Permit, etc.	Troy Mining TSF Vegetation
Sampler Name	Kara Beaudoin
Sampler Phone	(406) 291-7467
Sample Origin State	Montana
EPA/State Compliance	☐ Yes ☐ No

MINING CLIENTS, please indicate sample type.
*If ore has been processed or refined, call before sending.
☐ Byproduct 11 (e)2 material ☐ Unprocessed ore (NOT ground or refined)*

Matrix Codes
A - Air
W - Water
S - Soils/Solids
V - Vegetation
B - Bioassay
O - Other
DW - Drinking Water

All turnaround times are standard unless marked as RUSH.
Energy Laboratories MUST be contacted prior to RUSH sample submittal for charges and scheduling – See Instructions Paga

	Sample Identification (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers	Matrix (See Codes Above)	Total Metals	See Attached	RUSH TAT	ELI LAB ID (Laboratory Use Only)
1	H34-G	10/26/16	6:20 pm	1	V	✔			H16100582-091
2	H34-N	10/26/16	6:20 pm	1	V	✔			092
3	H37-S	10/26/16	5:15 pm	1	S	✔			093
4	H37-T	10/26/16	5:15 pm	1	S	✔			094
5	H37-G	10/26/16	5:15 pm	1	V	✔			095
6	H37-N	10/26/16	5:15 pm	1	V	✔			096
7	H39-S	10/26/16	2:50 pm	1	S	✔			097
8	H39-T	10/26/16	2:50 pm	1	S	✔			098
9	H39-G	10/26/16	2:50 pm	1	V	✔			099
10	H39-N	10/26/16	2:50 pm	1	V	✔			100

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	KARA BEAUDOIN	10/26/16 11:45 am				
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print)	Date/Time	Signature
					10/31/16 9:19	

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals	Intact	Receipt Temp	Temp Blank	On Ice	Payment Type	Amount	Receipt Number (cash/check only)
FedEx	Y	(Y) N C B	(Y) N	19.3 °C	Y (N)	Y (N)	CC Cash Check	$	

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Account Information (Billing information)

Company/Name	Revett
Contact	Skip Leedy
Phone	(406) 295-5882
Mailing Address	PO Box 1660
City, State, Zip	Troy, MT, 59935
Email	sleedy@hecla-mining.com
Receive Invoice	☐Hard Copy ☒Email
Receive Report	☐Hard Copy ☒Email
Purchase Order	
Quote	
Bottle Order	

Report Information (if different than Account Information)

Company/Name	
Contact	
Phone	
Mailing Address	
City, State, Zip	
Email	
Receive Report	☐Hard Copy ☐Email

Special Report/Formats:
☐ LEVEL IV ☐ NELAC ☐ EDD/EDT (contact laboratory) ☐ Other

Comments

Project Information

Project Name, PWSID, Permit, etc.	Troy Mining TSF Vegetation
Sampler Name	Kara Beaudoin
Sampler Phone	(406) 291-7467
Sample Origin State	Montana
EPA/State Compliance	☐ Yes ☐ No

MINING CLIENTS, please indicate sample type.
*If ore has been processed or refined, call before sending.
☐ Byproduct 11 (e)2 material ☐ Unprocessed ore (NOT ground or refined)*

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S - Soils/Solids
V - Vegetation
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O - Other
DW - Drinking Water

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	Sample Identification (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers	Matrix (See Codes Above)	Analysis Requested: Total Metals	See Attached	RUSH TAT	ELI LAB ID (Laboratory Use Only)
1	H40-S	10/26/16	2:30 pm	1	S	✓			1416100582-101
2	H40-T	10/26/16	2:30 pm	1	S	✓			102
3	H40-G	10/26/16	2:30 pm	1	V	✓			103
4	H40-N	10/26/16	2:30 pm	1	V	✓			104
5	H41-S	10/26/16	3:20 pm	1	S	✓			105
6	H41-T	10/26/16	3:20 pm	1	S	✓			106
7	H41-G	10/26/16	3:20 pm	1	V	✓			107
8	H41-N	10/26/16	3:20 pm	1	V	✓			108
9	H42-S	10/26/16	1:00 pm	1	S	✓			109
10	H42-T	10/26/16	1:00 pm	1	S	✓			110

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	Kara Beaudoin	10/28/16				
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print)	Date/Time	Signature
					10/31/16 9:19	

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals	Intact	Receipt Temp	Temp Blank	On Ice	Payment Type	Amount	Receipt Number (cash/check only)
FedEx	Y	(Y) N C B	(Y) N	19.3 °C	(Y) N	(Y) N	CC Cash Check	$	

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Account Information (Billing information)

Company/Name	Revett
Contact	Skip Leedy
Phone	(406) 295-5882
Mailing Address	PO Box 1660
City, State, Zip	Troy, MT, 59935
Email	sleedy@hecla-mining.com
Receive Invoice	☐Hard Copy ☒Email
Receive Report	☐Hard Copy ☒Email
Purchase Order	
Quote	
Bottle Order	

Report Information (if different than Account Information)

Company/Name	
Contact	
Phone	
Mailing Address	
City, State, Zip	
Email	
Receive Report	☐Hard Copy ☐Email

Special Report/Formats:
☐ LEVEL IV ☐ NELAC ☐ EDD/EDT (contact laboratory) ☐ Other

Comments

Project Information

Project Name, PWSID, Permit, etc.	Troy Mining TSF Vegetation
Sampler Name	Kara Beaudoin
Sampler Phone	(406) 291-7467
Sample Origin State	Montana
EPA/State Compliance	☐ Yes ☐ No

MINING CLIENTS, please indicate sample type.
*If ore has been processed or refined, call before sending.
☐ Byproduct 11 (e)2 material ☐ Unprocessed ore (NOT ground or refined)*

Matrix Codes
A - Air
W - Water
S - Soils/Solids
V - Vegetation
B - Bioassay
O - Other
DW - Drinking Water

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Energy Laboratories MUST be contacted prior to RUSH sample submittal for charges and scheduling – See Instructions Page

	Sample Identification (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers	Matrix (See Codes Above)	Total Metals	See Attached	RUSH TAT	ELI LAB ID (Laboratory Use Only)
1	H42-G	10/26/16	1:00 pm	1	V	✔			H16100582-111
2	H42-N	10/26/16	1:00 pm	1	V	✔			112
3	H43-S	10/26/16	12:30 pm	1	S	✔			113
4	H43-T	10/26/16	12:30 pm	1	S	✔			114
5	H43-G	10/26/16	12:30 pm	1	V	✔			115
6	H43-N	10/26/16	12:30 pm	1	V	✔			116
7	H44-S	10/25/16	6:25 pm	1	S	✔			117
8	H44-T	10/25/16	6:25 pm	1	S	✔			118
9	H44-G	10/25/16	6:25 pm	1	V	✔			119
10	H44-N	10/25/16	6:25 pm	1	V	✔			120

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	KARA BEAUDOIN	10/28/16 11:45am				
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print)	Date/Time	Signature
					10/31/16 9:19	

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals	Intact	Receipt Temp	Temp Blank	On Ice	Payment Type	Amount	Receipt Number (cash/check only)
FedEx		Y N C B	Y N	19.3 °C	Y N	Y N	CC Cash Check	$	

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ANALYTICAL SUMMARY REPORT

November 22, 2016

Revett Silver Company
PO Box 1660
Troy, MT 59935-1660

Work Order: H16110001 Quote ID: H1336 - Soil sampling

Project Name: Troy Mine TSF Sampling

Energy Laboratories Inc Helena MT received the following 18 samples for Revett Silver Company on 10/31/2016 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
H16110001-001	C1-(G-1-G-5) Composite	10/27/16 11:30	10/31/16	Vegetation	Metals by ICP/ICPMS, Total Digestion, Total Metals
H16110001-002	C2-(G1-G5) Composite	10/27/16 14:10	10/31/16	Vegetation	Same As Above
H16110001-003	C3-(G1-G5) Composite	10/27/16 11:30	10/31/16	Vegetation	Same As Above
H16110001-004	C1-G1	10/27/16 9:50	10/31/16	Vegetation	Soil Preparation
H16110001-005	C1-G2	10/27/16 10:40	10/31/16	Vegetation	Same As Above
H16110001-006	C1-G3	10/27/16 10:55	10/31/16	Vegetation	Same As Above
H16110001-007	C1-G4	10/27/16 11:10	10/31/16	Vegetation	Same As Above
H16110001-008	C1-G5	10/27/16 11:30	10/31/16	Vegetation	Same As Above
H16110001-009	C2-G1	10/27/16 11:50	10/31/16	Vegetation	Same As Above
H16110001-010	C2-G2	10/27/16 12:05	10/31/16	Vegetation	Same As Above
H16110001-011	C2-G3	10/27/16 12:15	10/31/16	Vegetation	Same As Above
H16110001-012	C2-G4	10/27/16 12:30	10/31/16	Vegetation	Same As Above
H16110001-013	C2-G5	10/27/16 14:10	10/31/16	Vegetation	Same As Above
H16110001-014	C3-G1	10/27/16 9:50	10/31/16	Vegetation	Same As Above
H16110001-015	C3-G2	10/27/16 10:40	10/31/16	Vegetation	Same As Above
H16110001-016	C3-G3	10/27/16 10:55	10/31/16	Vegetation	Same As Above
H16110001-017	C3-G4	10/27/16 11:10	10/31/16	Vegetation	Same As Above
H16110001-018	C3-G5	10/27/16 11:30	10/31/16	Vegetation	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 3161 E. Lyndale Ave., Helena, MT 59604, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

The results as reported relate only to the item(s) submitted for testing.

If you have any questions regarding these test results, please call.

Report Approved By:

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mine TSF Sampling
Lab ID: H16110001-001
Client Sample ID: C1-(G-1-G-5) Composite

Report Date: 11/22/16
Collection Date: 10/27/16 11:30
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/09/16 23:33 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/09/16 23:33 / dck
Boron	3	mg/kg-dry		1		SW6010B	11/09/16 18:49 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/09/16 23:33 / dck
Copper	95	mg/kg-dry		1		SW6010B	11/09/16 18:49 / sld
Iron	656	mg/kg-dry		5		SW6010B	11/09/16 18:49 / sld
Lead	8	mg/kg-dry		1		SW6020	11/09/16 23:33 / dck
Manganese	201	mg/kg-dry		1		SW6010B	11/09/16 18:49 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/09/16 23:33 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/09/16 23:33 / dck
Zinc	18	mg/kg-dry		1		SW6010B	11/09/16 18:49 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mine TSF Sampling
Lab ID: H16110001-002
Client Sample ID: C2-(G1-G5) Composite

Report Date: 11/22/16
Collection Date: 10/27/16 14:10
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/09/16 23:36 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/09/16 23:36 / dck
Boron	2	mg/kg-dry		1		SW6010B	11/09/16 16:54 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/09/16 23:36 / dck
Copper	68	mg/kg-dry		1		SW6010B	11/09/16 16:54 / sld
Iron	634	mg/kg-dry		5		SW6010B	11/09/16 16:54 / sld
Lead	3	mg/kg-dry		1		SW6020	11/09/16 23:36 / dck
Manganese	272	mg/kg-dry		1		SW6010B	11/09/16 16:54 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/09/16 23:36 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/09/16 23:36 / dck
Zinc	23	mg/kg-dry		1		SW6010B	11/09/16 16:54 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mine TSF Sampling
Lab ID: H16110001-003
Client Sample ID: C3-(G1-G5) Composite

Report Date: 11/22/16
Collection Date: 10/27/16 11:30
DateReceived: 10/31/16
Matrix: Vegetation

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Antimony	ND	mg/kg-dry		1		SW6020	11/09/16 23:40 / dck
Arsenic	ND	mg/kg-dry		1		SW6020	11/09/16 23:40 / dck
Boron	2	mg/kg-dry		1		SW6010B	11/09/16 16:58 / sld
Cadmium	ND	mg/kg-dry		1		SW6020	11/09/16 23:40 / dck
Copper	106	mg/kg-dry		1		SW6010B	11/09/16 16:58 / sld
Iron	391	mg/kg-dry		5		SW6010B	11/09/16 16:58 / sld
Lead	2	mg/kg-dry		1		SW6020	11/09/16 23:40 / dck
Manganese	200	mg/kg-dry		1		SW6010B	11/09/16 16:58 / sld
Selenium	ND	mg/kg-dry		1		SW6020	11/09/16 23:40 / dck
Silver	ND	mg/kg-dry		1		SW6020	11/09/16 23:40 / dck
Zinc	14	mg/kg-dry		1		SW6010B	11/09/16 16:58 / sld

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mine TSF Sampling

Report Date: 11/22/16
Work Order: H16110001

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6010B								Analytical Run: ICP2-HE_161109C	
Lab ID: ICV	Initial Calibration Verification Standard								11/09/16 13:17
Boron	0.797	mg/L	0.10	100	90	110			
Copper	0.795	mg/L	0.010	99	90	110			
Iron	3.98	mg/L	0.030	99	90	110			
Manganese	3.95	mg/L	0.010	99	90	110			
Zinc	0.814	mg/L	0.010	102	90	110			
Lab ID: ICSA	Interference Check Sample A								11/09/16 13:55
Boron	-0.00474	mg/L	0.10		0	0			
Copper	0.00252	mg/L	0.010		0	0			
Iron	191	mg/L	0.030	96	80	120			
Manganese	-0.00227	mg/L	0.010		0	0			
Zinc	0.00434	mg/L	0.010		0	0			
Lab ID: ICSAB	Interference Check Sample AB								11/09/16 13:59
Boron	0.976	mg/L	0.10	98	80	120			
Copper	0.506	mg/L	0.010	101	80	120			
Iron	186	mg/L	0.030	93	80	120			
Manganese	0.477	mg/L	0.010	95	80	120			
Zinc	1.00	mg/L	0.010	100	80	120			
Method: SW6010B								Batch: 35106	
Lab ID: LFB-35106	Laboratory Fortified Blank				Run: ICP2-HE_161109C				11/09/16 16:43
Boron	48.8	mg/kg	1.0	99	80	120			
Copper	49.2	mg/kg	1.0	100	80	120			
Iron	248	mg/kg	5.0	100	80	120			
Manganese	243	mg/kg	1.0	99	80	120			
Zinc	50.2	mg/kg	1.0	102	80	120			
Lab ID: LCS-35106	Laboratory Control Sample				Run: ICP2-HE_161109C				11/09/16 16:47
Boron	114	mg/kg	1.3	89	59.5	106.2			
Copper	127	mg/kg	1.0	93	76.6	108.8			
Iron	17100	mg/kg	6.6	105	51.7	131.9			
Manganese	446	mg/kg	1.0	103	81.1	116.6			
Zinc	248	mg/kg	1.7	108	75.3	111.7			
Lab ID: H16110001-003APDS	Post Digestion/Distillation Spike				Run: ICP2-HE_161109C				11/09/16 17:05
Boron	51.6	mg/kg-dry	1.0	99	75	125			
Copper	160	mg/kg-dry	1.0	107	75	125			
Iron	640	mg/kg-dry	5.0	99	75	125			
Manganese	446	mg/kg-dry	1.0	98	75	125			
Zinc	64.1	mg/kg-dry	1.0	99	75	125			
Lab ID: H16110001-003AMS	Sample Matrix Spike				Run: ICP2-HE_161109C				11/09/16 17:46
Boron	51.7	mg/kg-dry	1.0	102	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Revett Silver Company
Report Date: 11/22/16
Project: Troy Mine TSF Sampling
Work Order: H16110001

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **SW6010B**								Batch: 35106	
Lab ID: **H16110001-003AMS**	Sample Matrix Spike				Run: ICP2-HE_161109C			11/09/16 17:46	
Copper	164	mg/kg-dry	1.0	118	75	125			
Iron	736	mg/kg-dry	5.0	142	75	125			S
Manganese	449	mg/kg-dry	1.0	103	75	125			
Zinc	64.6	mg/kg-dry	1.0	103	75	125			
- S= Spike recovery outside of QC advisory limits. The recovery in the Laboratory Control Sample was within QC advisory limits. This suggests that the Matrix Spike recover is due to matrix interference.									
Lab ID: **H16110001-003AMSD**	Sample Matrix Spike Duplicate				Run: ICP2-HE_161109C			11/09/16 17:50	
Boron	50.6	mg/kg-dry	1.0	100	75	125	2.2	20	
Copper	169	mg/kg-dry	1.0	129	75	125	3.2	20	S
Iron	738	mg/kg-dry	5.0	143	75	125	0.3	20	S
Manganese	450	mg/kg-dry	1.0	103	75	125	0.2	20	
Zinc	62.7	mg/kg-dry	1.0	100	75	125	2.9	20	
- S= Spike recovery outside of QC advisory limits. The recovery in the Laboratory Control Sample was within QC advisory limits. This suggests that the Matrix Spike recover is due to matrix interference.									
Lab ID: **MB-35106**	Method Blank				Run: ICP2-HE_161109C			11/09/16 18:45	
Boron	0.3	mg/kg	0.3						
Copper	ND	mg/kg	0.2						
Iron	2	mg/kg	1						
Manganese	0.05	mg/kg	0.05						
Zinc	ND	mg/kg	0.3						

Qualifiers:

RL - Analyte reporting limit.
ND - Not detected at the reporting limit.
S - Spike recovery outside of advisory limits.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Revett Silver Company
Report Date: 11/22/16
Project: Troy Mine TSF Sampling
Work Order: H16110001

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **SW6020**								Analytical Run: ICPMS204-B_161109B	
Lab ID: **ICV STD**	Initial Calibration Verification Standard							11/09/16 09:53	
Antimony	0.0593	mg/L	0.0010	99	90	110			
Arsenic	0.0601	mg/L	0.0010	100	90	110			
Cadmium	0.0297	mg/L	0.0010	99	90	110			
Lead	0.0570	mg/L	0.0010	95	90	110			
Selenium	0.0588	mg/L	0.0010	98	90	110			
Silver	0.0290	mg/L	0.0010	97	90	110			
Method: **SW6020**								Batch: 35106	
Lab ID: **MB-35106**	Method Blank				Run: ICPMS204-B_161109B			11/09/16 22:03	
Antimony	ND	mg/kg	0.4						
Arsenic	ND	mg/kg	0.2						
Cadmium	ND	mg/kg	0.8						
Lead	ND	mg/kg	0.5						
Selenium	ND	mg/kg	0.7						
Silver	1	mg/kg	0.3						
Lab ID: **LCS-35106**	Laboratory Control Sample				Run: ICPMS204-B_161109B			11/09/16 22:07	
Antimony	70.1	mg/kg	1.0	29	0	92.9			
Arsenic	172	mg/kg	1.0	88	71.4	105.1			
Cadmium	94.5	mg/kg	1.0	95	73.9	106.1			
Lead	102	mg/kg	1.0	97	74.4	108.6			
Selenium	191	mg/kg	1.0	93	71.2	110.2			
Silver	40.0	mg/kg	1.0	92	70.8	111.9			
Lab ID: **LFB-35106**	Laboratory Fortified Blank				Run: ICPMS204-B_161109B			11/09/16 22:10	
Antimony	49.9	mg/kg	1.0	102	80	120			
Arsenic	48.6	mg/kg	1.0	99	80	120			
Cadmium	24.0	mg/kg	1.0	98	80	120			
Lead	47.8	mg/kg	1.0	98	80	120			
Selenium	48.0	mg/kg	1.0	98	80	120			
Silver	23.8	mg/kg	1.0	92	80	120			
Lab ID: **H16100422-134APDS**	Post Digestion/Distillation Spike				Run: ICPMS204-B_161109B			11/09/16 23:10	
Antimony	2490	mg/kg-dry	1.0	102	75	125			
Arsenic	2360	mg/kg-dry	1.0	96	75	125			
Cadmium	1120	mg/kg-dry	1.0	91	75	125			
Lead	2370	mg/kg-dry	1.0	96	75	125			
Selenium	2100	mg/kg-dry	1.0	86	75	125			
Silver	937	mg/kg-dry	1.0	77	75	125			
Lab ID: **H16110001-003APDS**	Post Digestion/Distillation Spike				Run: ICPMS204-B_161109B			11/09/16 23:46	
Antimony	2460	mg/kg-dry	1.0	101	75	125			
Arsenic	2300	mg/kg-dry	1.0	94	75	125			
Cadmium	1080	mg/kg-dry	1.0	89	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Revett Silver Company
Project: Troy Mine TSF Sampling

Report Date: 11/22/16
Work Order: H16110001

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **SW6020**									Batch: 35106
Lab ID: **H16110001-003APDS**	Post Digestion/Distillation Spike				Run: ICPMS204-B_161109B				11/09/16 23:46
Lead	2340	mg/kg-dry	1.0	96	75	125			
Selenium	2170	mg/kg-dry	1.0	89	75	125			
Silver	1020	mg/kg-dry	1.0	84	75	125			
Lab ID: **H16110001-003AMS**	Sample Matrix Spike				Run: ICPMS204-B_161109B				11/09/16 23:49
Antimony	50.8	mg/kg-dry	1.0	105	75	125			
Arsenic	47.6	mg/kg-dry	1.0	98	75	125			
Cadmium	23.9	mg/kg-dry	1.0	98	75	125			
Lead	48.5	mg/kg-dry	1.0	96	75	125			
Selenium	49.1	mg/kg-dry	1.0	101	75	125			
Silver	27.3	mg/kg-dry	1.0	112	75	125			
Lab ID: **H16110001-003AMSD**	Sample Matrix Spike Duplicate				Run: ICPMS204-B_161109B				11/09/16 23:53
Antimony	47.3	mg/kg-dry	1.0	98	75	125	7.1	20	
Arsenic	46.6	mg/kg-dry	1.0	96	75	125	2.1	20	
Cadmium	22.7	mg/kg-dry	1.0	94	75	125	5.2	20	
Lead	48.7	mg/kg-dry	1.0	97	75	125	0.4	20	
Selenium	44.9	mg/kg-dry	1.0	93	75	125	8.8	20	
Silver	25.6	mg/kg-dry	1.0	105	75	125	6.5	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

Work Order Receipt Checklist

Revett Silver Company

H16110001

Login completed by: Wanda Johnson
Date Received: 10/31/2016

Reviewed by: BL2000\wjohnson
Received by: bjs

Reviewed Date: 11/3/2016
Carrier name: FedEx Express

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☐	No ☑	Not Applicable ☐
Container/Temp Blank temperature:	18.5°C No Ice		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	Not Applicable ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Contact and Corrective Action Comments:

Sample container does not have dates/times. The sample time used was the latest for each sample. wj 11/1/16

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Chain of Custody & Analytical Request Record

www.energylab.com

Page 1 of 2

Account Information (Billing information)

Company/Name	Revett
Contact	Skip Leedy
Phone	(406) 295-5882
Mailing Address	PO Box 1660
City, State, Zip	Troy, MT 59935
Email	sleedy@hecla-mining.com
Receive Invoice	☐Hard Copy ☒Email
Receive Report	☐Hard Copy ☒Email
Purchase Order	
Quote	
Bottle Order	

Report Information (if different than Account Information)

Company/Name	
Contact	
Phone	
Mailing Address	
City, State, Zip	
Email	
Receive Report	☐Hard Copy ☐Email

Special Report/Formats:
☐ LEVEL IV ☐ NELAC ☐ EDD/EDT (contact laboratory) ☐ Other_____

Comments

Project Information

Project Name, PWSID, Permit, etc.	Troy Mine TSF Sampling
Sampler Name	Kara Beaudoin
Sampler Phone	(406) 291-7467
Sample Origin State	Montana
EPA/State Compliance	☐ Yes ☐ No

MINING CLIENTS, please indicate sample type.
*If ore has been processed or refined, call before sending.
☐ Byproduct 11 (e)2 material ☐ Unprocessed ore (NOT ground or refined)*

Matrix Codes
A - Air
W - Water
S - Soils/Solids
V - Vegetation
B - Bioassay
O - Other
DW - Drinking Water

All turnaround times are standard unless marked as RUSH.
Energy Laboratories MUST be contacted prior to RUSH sample submittal for charges and scheduling – See Instructions Page

Sample Identification (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers	Matrix (See Codes Above)	Analysis Requested: Total Metals	See Attached	RUSH TAT	ELI LAB ID (Laboratory Use Only)
1 C1-G1	10/27/16	9:50 am	1	V	✔			H16110001
2 C1-G2	10/27/16	10:40 am	1	V	✔			
3 C1-G3	10/27/16	10:55 am	1	V	✔			
4 C1-G4	10/27/16	11:10 am	1	V	✔			
5 C1-G5	10/27/16	11:30 am	1	V	✔			
6 C2-G1	10/27/16	11:50 am	1	V	✔			
7 C2-G2	10/27/16	12:05 ~~am~~ pm KMB	1	V	✔			
8 C2-G3	10/27/16	12:15 ~~am~~ pm KMB	1	V	✔			
9 C2-G4	10/27/16	12:30 ~~am~~ pm KMB	1	V	✔			
10 C2-G5	10/27/16	2:10 pm	1	V	✔			

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	KARA BEAUDOIN	10/28/16 1245				
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print)	Date/Time	Signature
				B Scher	10/31/16 9:19	Brandy Scher

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals	Intact	Receipt Temp	Temp Blank	Office	Payment Type	Amount	Receipt Number (cash/check only)
FedEx	box	Y N C B	Y N	18.5 °C	Y N	Y N	CC Cash Check_____	$	

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All subcontracted data will be clearly notated on your analytical report.

Chain of Custody & Analytical Request Record

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www.energylab.com

Account Information *(Billing information)*

Company/Name	Revett
Contact	Skip Leedy
Phone	(406) 295-5882
Mailing Address	PO Box 1660
City, State, Zip	Troy, MT 59935
Email	sleedy@hecla-mining.com
Receive Invoice	☐Hard Copy ☒Email
Receive Report	☐Hard Copy ☒Email
Purchase Order	
Quote	
Bottle Order	

Report Information *(if different than Account Information)*

Company/Name	
Contact	
Phone	
Mailing Address	
City, State, Zip	
Email	
Receive Report	☐Hard Copy ☐Email

Special Report/Formats:
☐ LEVEL IV ☐ NELAC ☐ EDD/EDT *(contact laboratory)* ☐ Other_____

Comments

Project Information

Project Name, PWSID, Permit, etc.	Troy Mine TSF Sampling
Sampler Name	Kara Beaudoin
Sampler Phone	(406) 291-7467
Sample Origin State	Montana
EPA/State Compliance	☐ Yes ☐ No

MINING CLIENTS, please indicate sample type.
*If ore has been processed or refined, call before sehoing.
☐ Byproduct 11 (e)2 material ☐ Unprocessed ore (NOT ground or refined)*

Matrix Codes
A - Air
W - Water
S - Soils/Solids
V - Vegetation
B - Bioassay
O - Other
DW - Drinking Water

Analysis Requested

All turnaround times are standard unless marked as RUSH.

Energy Laboratories MUST be contacted prior to RUSH sample submittal for charges and scheduling – See instructions Page

Sample Identification *(Name, Location, Interval, etc.)*	Collection Date	Collection Time	Number of Containers	Matrix *(See Codes Above)*	Total Metals	See Attached	RUSH TAT	EL LAB ID *Laboratory Use Only*
1 C3-G1	10/27/16	9:50 am	1	V	✔			H16110001
2 C3-G2	10/27/16	10:40 am	1	V	✔			
3 C3-G3	10/27/16	10:55 am	1	V	✔			
4 C3-G4	10/27/16	11:10 am	1	V	✔			
5 C3-G5	10/27/16	11:30 am	1	V	✔			
6								
7								
8								
9								
10								

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	KARA BEAUDOIN	10/28/16 11:45am				
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print)	Date/Time	Signature
					10/31/16 9:19	

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals	Intact	Receipt Temp	Temp Blank	On Ice	Payment Type	Amount	Receipt Number *(cash/check only)*
Fed Ex	box	Y N C B	Y N	18.5 °C	Y N	Y N	CC Cash Check_____	$	

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All subcontracted data will be clearly notated on your analytical report.

Appendix B

ProUCL Statistical Output

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Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options

Date/Time of Computation	11/14/2016 11:25
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: Cu - Deep
Sample 2 Data: Cu - Shallow

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	16	16
Number of Distinct Observations	4	7
Minimum	2	2
Maximum	5	14
Mean	3.5	4.438
Median	3	3
SD	0.966	3.265
SE of Mean	0.242	0.816

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 = Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	267
WMW U-Stat	131
Mean (U)	128
SD(U) - Adj ties	24.75
Lower U-Stat Critical Value (0.025)	76
Upper U-Stat Critical Value (0.975)	180
Standardized WMW U-Stat	0.121
Approximate P-Value	0.903

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 = Sample 2

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	11/14/2016 11:26
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: Fe - Deep
Sample 2 Data: Fe - Shallow

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	16	16
Number of Distinct Observations	15	14
Minimum	49	43
Maximum	103	339
Mean	71.38	88.38
Median	71.5	66.5
SD	17.07	72.35
SE of Mean	4.268	18.09

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 = Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	270
WMW U-Stat	134
Mean (U)	128
SD(U) - Adj ties	26.51
Lower U-Stat Critical Value (0.025)	76
Upper U-Stat Critical Value (0.975)	180
Standardized WMW U-Stat	0.226
Approximate P-Value	0.821

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 = Sample 2

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	11/14/2016 11:27
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: Mn - Deep
Sample 2 Data: Mn - Shallow

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	16	16
Number of Distinct Observations	16	14
Minimum	103	81
Maximum	304	391
Mean	164.2	189.6
Median	157.5	175
SD	57.05	84.25
SE of Mean	14.26	21.06

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 = Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	239
WMW U-Stat	103
Mean (U)	128
SD(U) - Adj ties	26.53
Lower U-Stat Critical Value (0.025)	76
Upper U-Stat Critical Value (0.975)	180
Standardized WMW U-Stat	-0.942
Approximate P-Value	0.346

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 = Sample 2

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options

Date/Time of Computation	11/14/2016 11:28
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: Zn - Deep
Sample 2 Data: Zn - Shallow

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	16	16
Number of Distinct Observations	12	13
Minimum	11	10
Maximum	42	40
Mean	22.5	24.38
Median	22	24
SD	9.216	8.35
SE of Mean	2.304	2.087

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 = Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	248
WMW U-Stat	112
Mean (U)	128
SD(U) - Adj ties	26.5
Lower U-Stat Critical Value (0.025)	76
Upper U-Stat Critical Value (0.975)	180
Standardized WMW U-Stat	-0.604
Approximate P-Value	0.546

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 = Sample 2

Appendix C

Photograph Log of Analyzed Sample Locations

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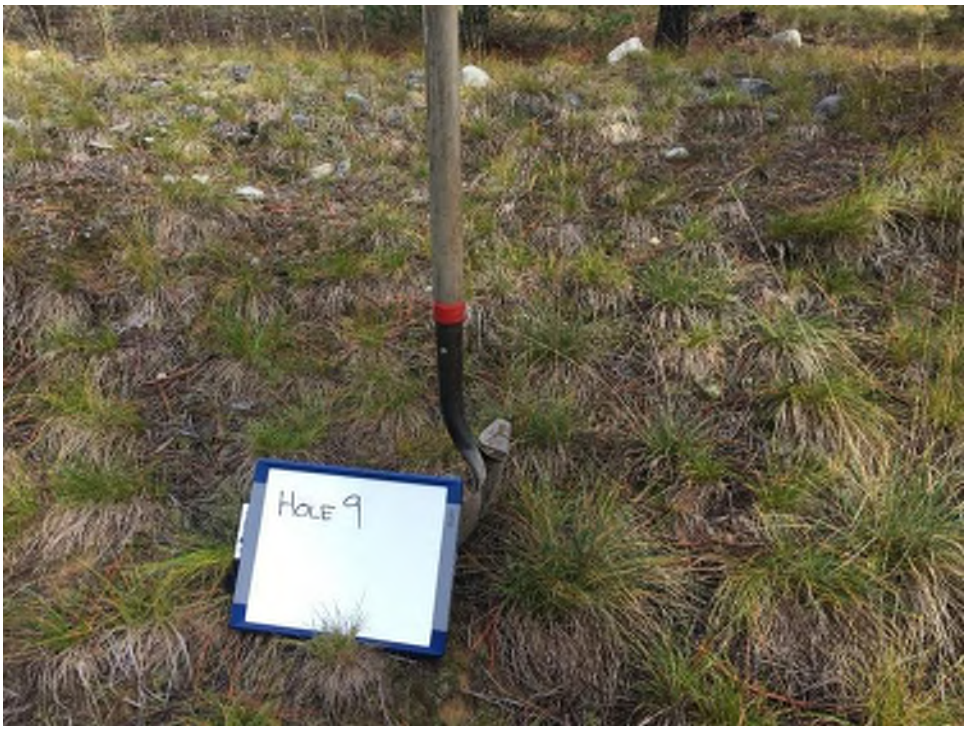
Photograph Log of Analyzed Sample Collection Locations

Date: 10/24/2016 **Filename:** Hole 05_01.JPG **Location**: Troy Mine Tailing Storage Facility **Photo Location:** TSF Embankment **Photo Description:** Photo of Hole 05 prior to excavation	
Date: 10/25/2016 **Filename:** Hole 05_02.JPG **Location:** Troy Mine Tailing Storage Facility **Photo Location:** TSF Embankment **Photo Description:** Photo of Hole 05 after sampling	

Date: 10/24/2016 **Filename:** Hole 07_01.JPG **Location**: Troy Mine Tailing Storage Facility **Photo Location:** TSF Embankment **Photo Description:** Photo of Hole 07 prior to excavation	
Date: 10/25/2016 **Filename:** Hole 07_02.JPG **Location:** Troy Mine Tailing Storage Facility **Photo Location:** TSF Embankment **Photo Description:** Photo of Hole 07 after sampling	

Date: 10/24/2016 **Filename:** Hole 09_01.JPG **Location**: Troy Mine Tailing Storage Facility **Photo Location:** TSF Embankment **Photo Description:** Photo of Hole 09 prior to excavation **Direction:** NA	
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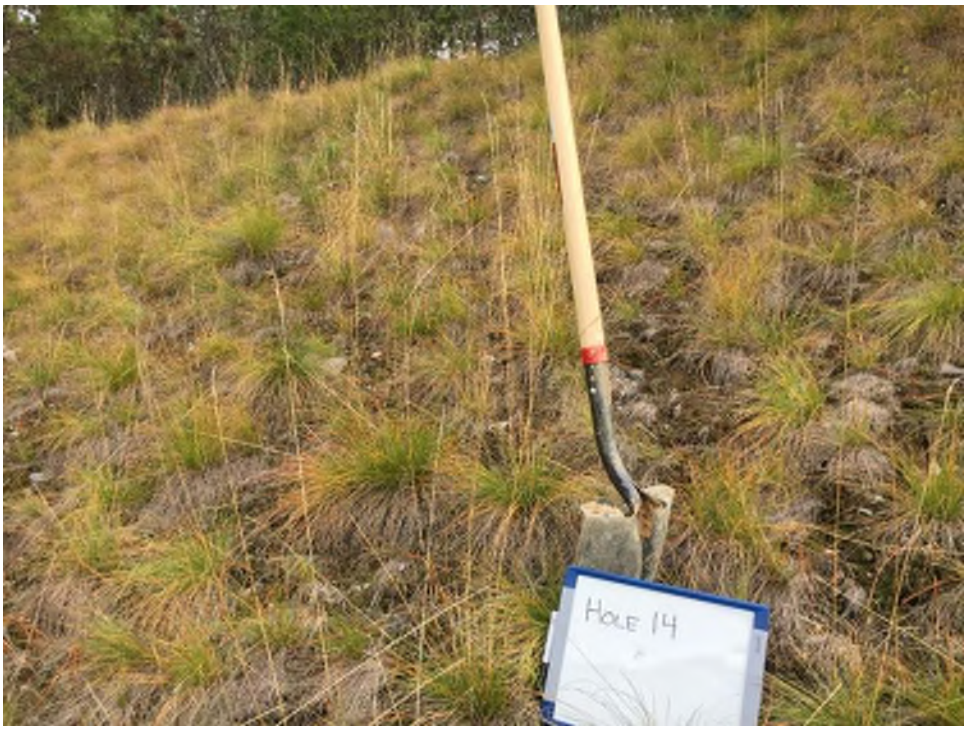
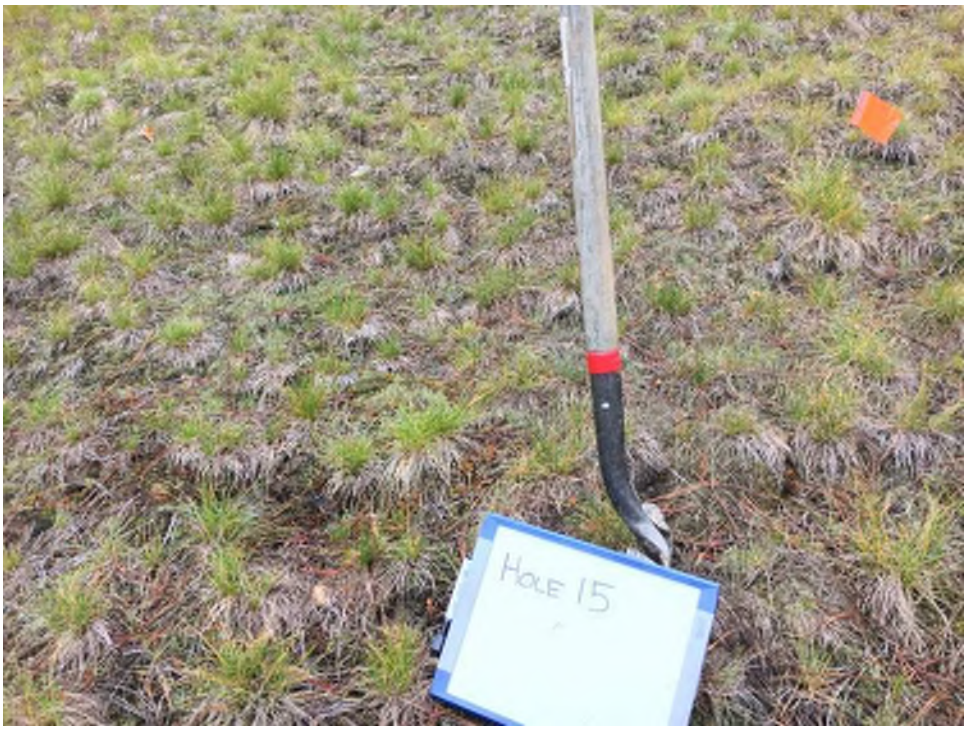
Date: 10/24/2016 **Filename:** Hole 14_01.JPG **Location**: Troy Mine Tailing Storage Facility **Photo Location:** TSF Embankment **Photo Description:** Photo of Hole 14 prior to excavation **Direction:** NA	
Date: 10/25/2016 **Filename:** Hole 14_02.JPG **Location:** Troy Mine Tailing Storage Facility **Photo Location:** TSF Embankment **Photo Description:** Photo of Hole 14 after sampling	

Date: 10/24/2016 **Filename:** Hole 15_01.JPG **Location**: Troy Mine Tailing Storage Facility **Photo Location:** TSF Embankment **Photo Description:** Photo of Hole 15 prior to excavation **Direction:** NA	
Date: 10/25/2016 **Filename:** Hole 15_02.JPG **Location:** Troy Mine Tailing Storage Facility **Photo Location:** TSF Embankment **Photo Description:** Photo of Hole 15 after sampling	

Date: 10/24/2016

Filename: Hole 19_01.JPG

Location: Troy Mine Tailing Storage Facility

Photo Location: TSF Embankment

Photo Description: Photo of Hole 19 prior to excavation

Direction: NA

Date: 10/26/2016

Filename: Hole 19_02.JPG

Location: Troy Mine Tailing Storage Facility

Photo Location: TSF Embankment

Photo Description: Photo of Hole 19 after sampling

Date: 10/24/2016 **Filename:** Hole 22_01.JPG **Location**: Troy Mine Tailing Storage Facility **Photo Location:** TSF Embankment **Photo Description:** Photo of Hole 22 prior to excavation **Direction:** NA	
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Date: 10/25/2016 **Filename:** Hole 28_01.JPG **Location**: Troy Mine Tailing Storage Facility **Photo Location:** TSF Embankment **Photo Description:** Photo of Hole 28 prior to excavation **Direction:** NA	
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Date: 10/25/2016 **Filename:** Hole 33_01.JPG **Location**: Troy Mine Tailing Storage Facility **Photo Location:** TSF Embankment **Photo Description:** Photo of Hole 33 prior to excavation **Direction:** NA	
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Date: 10/25/2016 **Filename:** Hole 34_01.JPG **Location**: Troy Mine Tailing Storage Facility **Photo Location:** TSF Embankment **Photo Description:** Photo of Hole 34 prior to excavation **Direction:** NA	
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Date: 10/25/2016 **Filename:** Hole 39_01.JPG **Location**: Troy Mine Tailing Storage Facility **Photo Location:** TSF Embankment **Photo Description:** Photo of Hole 39 prior to excavation **Direction:** NA	
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Date: 10/25/2016 **Filename:** Hole 42_01.JPG **Location**: Troy Mine Tailing Storage Facility **Photo Location:** TSF Embankment **Photo Description:** Photo of Hole 42 prior to excavation **Direction:** NA	
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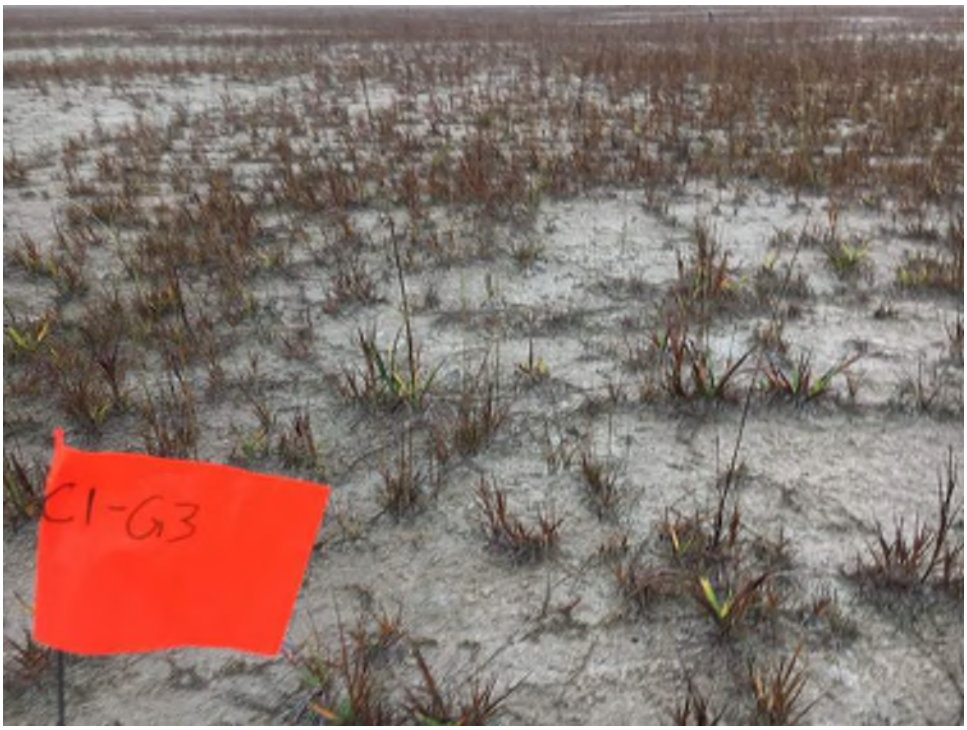
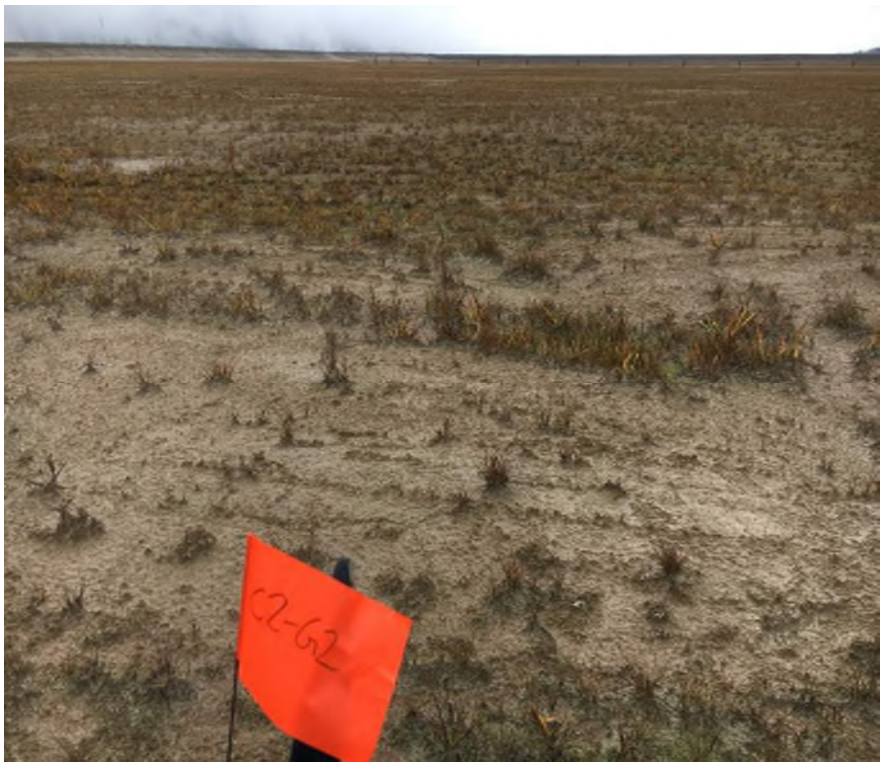
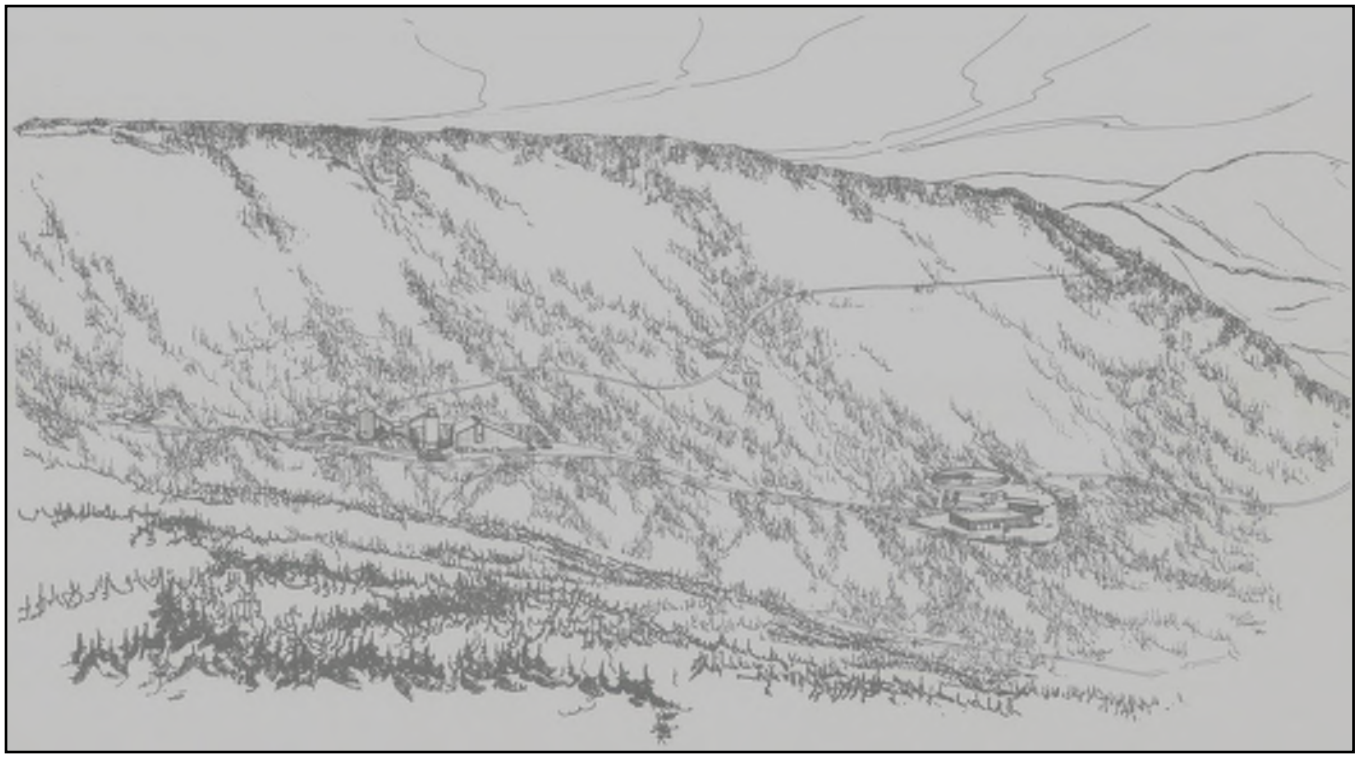
Date: 10/27/2016 **Filename:** TSF_Top_C1-G3.JPG **Location**: Troy Mine Tailing Storage Facility **Photo Location:** Top of TSF **Photo Description:** Location C1-G3 - General view of vegetation on top of the TSF **Direction:** NA	
Date: 10/27/2016 **Filename:** TSF_Top_C2-G2.JPG **Location:** Troy Mine Tailing Storage Facility **Photo Location:** Top of TSF **Photo Description:** Location C2-G2 - General view of vegetation on top of the TSF	

Attachment C – Replacement Reclamation Plan pages per ARM 17.24.119 (3)(b)

TROY MINE

REVISED RECLAMATION PLAN
DECEMBER 2016 FINAL



Prepared by:
Troy Mine, Inc.

December 2000
May 2004
October 2005
March 2006
January 2008
May 2015
January 2016
March 2016
May 2016
September 2016

3.6 UTILITY CORRIDOR

The utility corridor consists of the tailing lines (two, 8-inch steel pipes), a maintenance sump, a buried reclaim water line (10 to 12-inch steel pipe), and the 115 kV electrical power line (Exhibit A). The maintenance sump is located approximately 1,500 feet south of the reclaim water sump and consists of an unlined, shallow excavation in native materials.

3.7 TAILING FACILITY

The existing layout of the tailing facility is shown in Exhibit E. The tailing facility is divided into four cells (Cells 1, 2, 3, and 4) by three divider dikes. These divider dikes are used to control placement of tailing and water in the impoundment and allow different sections of the impoundment to be managed individually. The tailing facility was originally designed to contain 60 million tons of tailing and to cover approximately 385 acres. To date, approximately 42.8 million tons of tailing (primarily milled quartzite) from the Troy Mine have been placed in the impoundment. Currently, the total area of disturbance on the impoundment surface is approximately 303 acres. An additional area of 79 acres including the topsoil stockpile area, decant pond, borrow areas, and roads will require reclamation (see Table 2-1). This area includes the cover soil stockpile location that will be disturbed during reclamation. Areas (48 acres) that will not require reclamation include the embankment face and toe ponds. Disturbance areas associated with the tailing facility are shown in Table 2-1.

Other features of the tailing facility include:

- Impoundment site topsoil stockpiles totaling approximately 354,000 cubic yards of salvaged topsoil located adjacent to the toe ponds on the west side of the impoundment dike and acting as a dike containing the toe ponds. Close-in aerial survey of the tailings area will be completed prior to completion of detailed cover placement engineering and planning. Revett will utilize the detailed survey data in conjunction with detailed engineering to develop a more accurate topsoil volume estimate.
- A small stockpile of approximately 994 cubic yards of topsoil salvaged from decant ponds construction stockpile located east of the impoundment.
- Two developed and one planned soil borrow sites located on the east side of the impoundment Exhibit E. Four toe ponds located along the perimeter of the toe of the primary dike. In 1982, water began seeping through the impoundment dike and emerged west of the impoundment dike. In 1983, an earthen berm, composed partially of stockpiled topsoil material, was constructed to contain the seepage, natural groundwater, and runoff from the dike face in the four toe ponds. The southern toe pond (toe pond #1) is typically dry. Water from toe ponds 2, 3, and 4 is typically pumped to the impoundment for 2 to 3 weeks during both the fall and the snowmelt period of each year.
- One decant pond (barge pond) located along the eastern margin of the impoundment. During operation of the mine, this pond receives tailing water and storm-water runoff from the impoundment. From the pond, reclaim water is pumped to the reclaim water pump station and then to the mill for reuse in the milling circuit. During the interim shutdown period and in the initial period following final closure, the decant pond

TABLE 4-2. ESTIMATED COVER SOIL VOLUME REQUIREMENTS

Description	Final Disturbed Area (acres)	Area Requiring Reclamation (Acres)	Soil Volume Required (cubic yards)	Soil Depth Required (inches)	Current Reclamation Status Proposed Soil Source	Proposed Soil Source
Tailings Impoundment Area						
Surface[1]	303	299	321,591	8	Temp cover placed on Cell 4 (36.5 acres)	Toe Pond topsoil piles
Decant Pond/Pump Station	1	1	1,076	8	None	Toe Pond topsoil piles
Tailings Impoundment Roads	11	11	11,831	8	None	Toe Pond topsoil piles
Toe Pond Topsoil Piles	44	44	-	-	New disturbance during reclamation.	Existing cover to be stripped
Embankment Face	43	0	-	-	Previously reclaimed	Toe Pond topsoil piles
East, NE and Cell 3 Borrow Sites	23	23	24,738	8	None	Toe Pond topsoil piles
Toe Ponds	5	0		-	None	To remain during post Closure
Subtotal	**430**	**378**	**359,236**			
Plant Site						
North Percolation Pond	1.5	0.0	-	-	Passively Reclaimed	None required
South Percolation Pond	0.6	0.6	968	12	None	Plant site fill/borrow
Lower Warehouse Pad	3.7	3.7	5,969	12	None	Plant site fill/borrow
Stormwater Pond	1.5	1.5	2,420	12	None	Plant site fill/borrow
Office and Shop Pad	11.5	11.5	18,553	12	None	Plant site fill/borrow
Office /Mill Corridor	2.7	0.0	-	-	None	Plant site fill/borrow
Mill Pad	11.5	8.8	14,197	12	Slopes natural revegetated	Plant site fill/borrow
Water Tank and Access Road	0.9	0.9	1,452	12	None	Plant site fill/borrow
Subtotal	**33.9**	**27.0**	**43,560**			
Mine Portals						
North Portal (Total Area)	12	9	14,520	12	Reclaim 9 acres, leave 3 acres talus	Local borrow/Mill area borrow
South Protal (Total Area)	3.3	2.5	4,033	12	Reclaim 2.5 acres, leave 0.8 acre talus	Local borrow/Mill area borrow
Subtotal	**15.3**	**11.5**	**18,553**			
Utility Corridor						
Tailings Line Footings	4.1	0.0	-	-	Previously reclaimed	None, remove line and revegetation
Process Pump Station and Pond	0.5	0.5	807	12	None	Local fill
Subtotal	**4.6**	**0.5**	**807**			
TOTAL ALL AREAS	**483.8**	**417.0**	**422,155.6**			

[1]Tailing surface area requireing cover soil is 299 acres. This reflects 4 acres that will be reclaimed as open water and will not require cover soil.

4.14 TAILING FACILITY

The tailings surface slopes to the east at an approximate grade of about one half of one percent. Surface flows will periodically inundate small areas on the eastern edge of the impoundment. Water will infiltrate and recharge groundwater. No major re-grading of the impoundment surface is proposed. If necessary, tailing surface in the vicinity of the decant ponds may be modified to prevent sediment from storm water runoff from the impoundment surface from draining directly to the decant ponds. The revegetated slopes of the tailings embankment would be inspected, and any bare areas where the tailings are exposed would be recovered with lacustrine and volcanic ash-derived soil materials and replanted.

Surveys were completed during October 2015 to determine the current tailings cell surface elevations. The nominal crest elevations of the tailings surface for Cell 1 is 2,429 feet, Cell 2 is 2,418 feet, and Cells 3 & 4 is 2,420 feet.

4.14.1 Stability Considerations

The long-term stability of the facility is high due to the design features of a fully drained impoundment. Monitoring wells and phreatic surface monitoring within the impoundment demonstrate that the facility continues to dewater. (See Appendix H - Tailing Impoundment Stability Report). Erosion of the facility by water and wind will be controlled by the soil/vegetation cover described below.

4.14.2 Toe Ponds

As described in the water management plan (Section 3.8.2), the toe ponds capture groundwater below the tailing facility. The toe ponds will be retained as permanent features to provide wildlife and wetlands habitat. Stockpiled soil west of the toe ponds would be used as cover soil over the tailings impoundment; however, sufficient soil would be left in-place to ensure that the toe ponds remain and function.

Post operation toe ponds are shown on Exhibit F. Toe ponds will be connected by inter-pond channels at closure. A conceptual design for an inter-pond channel structure is shown in Figure 4-6. No outfall from the post closure toe ponds is anticipated and although an armored outfall will be installed as a safety measure, no channel to Lake Creek is proposed. The Montana Department of Fish, Wildlife, and Parks (FWP) would survey the ponds for non-native fish species and determine whether removal of non-native fish is recommended. If so, FWP would issue a permit for this activity. Both inter-pond channel construction and non-native fish removal (if necessary) would not begin until September or when juvenile western toads are no longer observed at breeding sites.

4.14.3 Soil Cover

Up to 354,000 cubic yards of soil, stockpiled west of the toe ponds, would be removed and used for reclamation. BMPs would be used during removal to protect water quality and the western toad. The soil remaining in the stockpile would be configured so surface water is protected from sediment and the toe pond berm is maintained. Any additional cover soil for the tailing facility surface will be obtained from the borrow pits located to the east of the

impoundment (Exhibit A) and would meet Agency growth media specifications prior to placement. Tailing facility cover soil requirements are included in Table 4-2. Approximately 359,200 cubic yards of cover soil materials will be required for the tailings facility reclamation.

The volume of topsoil in the 44 acres pond stockpiles was recently estimated to approximately 354,000 bank cubic yards. Assuming ten percent swell between the bank volume and loosely placed volume an adjusted volume of 389,400 cubic yards of cover soil would be available. This value is approximately 108% of the volume required (approximately 359,200 cubic yards) to reclaim 378 acres at the tailings facility. The EIS indicated that 818,500 cubic yards of material was stockpiled in the toe pond stockpile within the 44 acre location; however recent investigations indicate that the volume is only 354,000 (Knight Piesold 2016). If during construction, a shortage of material occurs, additional material could be excavated from the borrow areas east of the tailings impoundment as provided in Attachment 8 of the ROD. Cover material originating from borrow areas will meet Agency growth media specifications prior to placement. Alternatively, Revett Silver would work with the Agencies to identify and utilize other potential cover soil borrow areas on Troy Mine owned property immediately surrounding the tailings facility. Toe pond stockpiles would be used first, then borrow would be used for the balance if needed. As tailings impoundment cover work proceeds, toe pond stockpile material will be used first followed by any required make-up from borrow areas.

The planned approach to impoundment cover soil placement will be to complete placement in one lift in order to minimize compaction. A cover soil thickness of 8 inches is planned for the tailings surface. The existing vegetation over the Cell 4 surface would be incorporated into the glacial cover by ripping prior to placement of the final cover soil. This would also reduce the compaction of the temporary cover layer.

Additional tailings facility areas requiring reclamation include the reclaim pump station pond, maintenance pond, tailings impoundment roads, and East Borrow sites.

5.0 SOIL RESOURCES

The facility removal and regrading plan (Section 4) and the revegetation plan (Section 6) describe use of available topsoil and subsoil resources. To evaluate the available soil resources, investigations of stockpiled soil and borrow soil sites were conducted in October, 2000, August 2015, and September 2016 (Knight Piesold 2016). Selected stockpile and borrow sites were sampled for laboratory analysis of relevant physical and chemical parameters. Appendix C presents the report for the recent investigation "Characterization of Vegetation and Soil Properties at the Troy Mine, Lincoln County, Montana" (KC Harvey Environmental, LLC. January 2016). This report provides the basis for characterization of the stockpiled cover soil at the tailings facility and compares stockpiled soils to undisturbed native soil sites adjacent to the tailings and mine mill area, and with one revegetated location near the mill. Characterization of vegetation in the tailings and mine mill areas is also provided.

5.1 SOIL INVESTIGATIONS

In order to characterize the potential of stockpiled soil at the tailings facility and native soils a sampling and testing program was completed in August of 2015 that included logging and sampling six test pits within the toe pond stockpiled at the tailings facility: excavating two pits to characterize the current tailings impoundment Cell 4 cover: four native soil locations in the area of the tailings impoundment; one native soil location in the mill area; and, one revegetated area in the mill area. Characterization of vegetation in all areas investigated was also completed and is presented in Appendix C.

Native soils in these areas were evaluated for comparison and reference in the design of impoundment and plant site reclamation cover soils. Appendix C provides a detailed description of the soil test pits, laboratory results, and provides a comparison between stockpiled soil and native soil locations. Analysis to characterize fertility of stockpiled soil included total nitrogen, plant available nitrogen, organic matter carbon nitrogen ratio, potassium, and phosphorus. Native soil sites were evaluated for the same parameters. Analysis of physical and chemical parameters including texture, saturation percentage, EC, pH, and SAR, was also completed. All samples were collected as a composite through the thickness of a given topsoil or subsoil horizon. Stockpiled soil was sampled from the surface to 18-inch depth, and a composite sample below 18 inches. Tailing facility soil test pit locations are presented in Figure 5-1. The locations of borrow soils in the office/shop area are illustrated on Figure 5-2.

Field observations recorded at each sample location include a description of soil horizons. Coarse fragment contents were estimated for each horizon. Additional pit site observations included moisture content, slope, aspect, and vegetation.

The Knight Piesold investigation reports that the soils (topsoil and lacustrine) in the stockpiles west of the tailings impoundment range in depth from 0.3 feet to 11.5 feet (Knight Piesold 2016). This information was used to estimate that approximately 354,000 cubic yards of soil is available for use as cover soil from the stockpiles.

10.0 REFERENCES

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